Coastal and Social Resiliency Initiatives for Tottenville Shoreline

Richmond County, NY

Joint Record of Decision and Findings Statement

August 2018

Governor's Office of Storm Recovery

National Environmental Policy Act and New York State Environmental Quality Review Act

JOINT ROD and FINDINGS STATEMENT

Governor's Office of Storm Recovery, an office of the
New York State Housing Trust Fund Corporation

Coastal and Social Resiliency Initiatives for the Tottenville Shoreline

Borough of Staten Island

Richmond County, New York

This Joint Record of Decision and State Environmental Quality Review Act (SEQRA) Findings Statement (Joint ROD and Findings Statement) documents the Governor's Office of Storm Recovery's (GOSR's) findings and decision to proceed with the Proposed Actions as described in the Final Environmental Impact Statement (FEIS) (EIS No. 20180132) for the Coastal and Social Resiliency Initiatives for Tottenville Shoreline.

On behalf of the State of New York, the Governor's Office of Storm Recovery (GOSR) is acting under the auspices of the New York State Homes and Community Renewal's Housing Trust Fund Corporation (HTFC), and under authority of the U.S. Department of Housing and Urban Development's (HUD) regulations at (CFR) § 58.2(a)(7)(i) as the Responsible Entity, and as the lead agency responsible for environmental review, decision-making, and action under 42 U.S.C § 5304(g), has prepared this Joint ROD and Findings Statement in accordance with the National Environmental Policy Act (NEPA; 42 USC § 4321 et seq.) and the Council on Environmental Quality (CEQ) regulations implementing NEPA 40 CFR Parts 1500 to 1508.

This Joint ROD and Findings Statement is also prepared in accordance with SEQRA (New York Environmental Conservation Law (ECL) Article 8 (8-0101-8-0117)). GOSR has given consideration to the facts and conclusions relied upon in the FEIS and determined that the requirements of Article 8, Section 8-0109 of the ECL and implementing regulations (6 NYCRR Part 617) have been met.

GOSR has selected Alternative 2, the Layered Tottenville Shoreline Resiliency Strategy: Living Breakwaters Project and Tottenville Shoreline Protection Project for the Coastal and Social Resiliency Initiatives for Tottenville Shoreline (the Selected Alternative). This alternative is fully described in Chapter 1, "Purpose and Need and Alternatives," of the FEIS. The FEIS was signed by GOSR on June 1, 2018. On June 13, 2018, GOSR issued the joint Notice of Availability/Notice of Completion for the FEIS through publication in the New York State Environmental Notices Bulletin and newspapers of general circulation within the affected community. On June 15, 2018, the U.S. Environmental Protection Agency published notice of its receipt and review of the FEIS in the Federal Register.

The FEIS was made available for public review until July 16, 2018 via the following web address: https://stormrecovery.ny.gov/environmental-docs as well as at the offices of GOSR and the New York Public Library, Tottenville Branch.

1 PROJECT AREA AND VICINITY

The Proposed Actions would be undertaken in the Tottenville section of Staten Island, along the neighborhood's southern shoreline and offshore within the waters of Raritan Bay. Tottenville is located at the southwestern tip of Staten Island, and is the southernmost neighborhood in New York City and State. It is bounded by water on three sides, with the Arthur Kill to the west and north and Raritan Bay to the south. The project area is located in the southwestern corner of Tottenville where these waterways meet. Raritan Bay, is a shallow urban estuary that contains significant habitat for shellfish and marine, estuarine, and anadromous fish. It supports multiple commercial fisheries and recreationally important fish species. The open waters of the bay provide important habitat for overwintering and staging waterfowl and marine mammals can occur in the area.

Land uses in the project area are characterized by a mix of parkland and residential uses, with some privately owned vacant parcels. The largest single land use in the project area is Conference House Park, a 265-acre park under the jurisdiction of the NYC Department of Parks and Recreation (NYC Parks). Extensive natural areas make up the park, including large tracts of maritime forest, creeks and ponds, bluffs, coastal wetlands, and beaches lining the shore. The western portion of Conference House Park contains numerous amenities and attractions, including grassy and densely wooded areas, historic architectural resources, a visitor's center, the Lenape Playground at Swinnerton Street and Billop Avenue, walking and biking paths, hiking trails, and the "South Pole" marking the southernmost point of New York State. The park extends eastward along the shoreline in a narrow expanse that includes beach areas, grassy areas, and look out points from the terminus of certain streets including Manhattan Street and Sprague Avenue. The shoreline is fringed by a sand and cobble beach. A man-made temporary dune, installed following Superstorm Sandy, consisting of sand filled barrier bags provides interim erosion control and coastal flood risk reduction from approximately Swinnerton Street to Sprague Avenue. The area near Page Avenue represents the eastern limits of Conference House Park. West of Page Avenue is a grassy undeveloped site that contains a few trees and a narrow paved street.

Inland from Conference House Park, the project area is residential in nature, characterized by single-family detached and attached houses. West of Brighton Street, these residential areas are adjacent to a wooded section of Conference House Park primarily along Billop Avenue and Swinnerton Street; east of Brighton Street, residential areas are developed in closer proximity to the shoreline with beach and vegetated upland separating the neighborhood from the waters of Raritan Bay. Since Superstorm Sandy, some homes in this coastal area have been elevated. The blocks between Loretto Street and Sprague Avenue contain several developments consisting of two-family houses and attached single-family houses on small private streets. East of Sprague Avenue to Page Avenue, large vacant or wooded areas are interspersed with tracts of single-family houses including some houses on larger lots. In the area south of Amboy Road, approximately 80 percent of the population own their home. South of Hylan Avenue, owner occupancy is slightly higher at 81.3 percent. The remaining population rent their homes.

2 PROJECT BACKGROUND

Staten Island's South Shore was once buffered from wave action by a wide, shallow bathymetric shelf known as the "West Bank." Until the mid-19th century, oyster reefs and then leased oyster beds extended across the shallow waters of Raritan Bay, filtering water, enhancing the biodiversity and quality of the fisheries in the lower harbor and buffering the south shore from erosion-causing wave action. In the 19th and 20th centuries, changes in land use and populations drove widespread decline in water quality, habitat extents and beach widths across the bay, decreasing the quality of the Bay ecosystem and increasing coastal risk to inhabitants and assets along its shoreline.

On October 29, 2012, Superstorm Sandy approached New York City with tropical-storm-force winds. The resultant waves and storm surge battered the city's coastline, causing 44 deaths in New York City—23 of which occurred in Staten Island—the destruction of homes and other buildings, and damage to critical infrastructure. Sandy's effects—including powerful waves and large volumes of water—were particularly intense in neighborhoods across Southern Queens, Southern Brooklyn, and the East and South Shores of Staten Island. According to the New York City Department of Buildings (NYCDOB), these neighborhoods accounted for over 70 percent of the buildings in Sandy-inundated areas that had been seriously damaged or destroyed as of December 2012.

Winds out of the northeast generated powerful waves along the South Shore of Staten Island (which adjoins the waters of Raritan Bay), resulting in significant erosion, including at the area's protective bluffs and along the shoreline areas with already narrow beach conditions. The peak storm tides in Tottenville measured approximately 16 feet, almost five feet higher than at the Battery in Manhattan. Many of the homes that were hit around Tottenville Beach were destroyed. Tottenville businesses also sustained structural damage, with some emerging from the storm with only wall studs remaining on the first floors.[1]

Superstorm Sandy significantly impacted the project area, highlighting existing deficiencies in the project area's resiliency and ability to adequately protect populations and facilities from major coastal storm events.

REBUILDING AND RESILIENCY PLANNING

Following the storm, the City formed the Special Initiative for Rebuilding and Resiliency (SIRR) to analyze the impacts of the storm on the city's buildings, infrastructure, and people; assess climate change risks in the medium term (2020s) and long term (2050s); and outline strategies for increasing resiliency citywide. *PlaNYC—A Stronger, More Resilient New York,* June 2013, was the result of that effort, and contains Community Rebuilding Resiliency Plans for five particularly vulnerable neighborhoods in NYC, one of which is the East and South Shores of Staten Island. In developing the plan for the East and South Shores, two task forces met regularly and numerous formal and informal working sessions were held, including two public workshops in March 2013. These sessions provided an opportunity to the affected communities to inform SIRR staff of specific priorities and challenges that needed to be addressed. Two key priorities identified were developing coastal and shoreline protections, and ensuring public access to the waterfront.

The Community Rebuilding Resiliency Plan for the East and South Shores of Staten Island outlines specific initiatives to address coastal protection, buildings, critical infrastructure and community and economic recovery. The coastal protection initiatives considered the nature and likelihood of coastal hazards, the potential impact of these hazards on the built environment and critical infrastructure, and the likely effectiveness of the proposed measures. The coastal protection measures were also informed by the New York City Department of City Planning's (NYCDCP's) *Urban Waterfront Adaptive Strategies (UWAS)* study, June 2013, which examined the underlying geomorphology of the various regions, demonstrating that the South Shore of Staten Island is particularly vulnerable to erosion during extreme events, as well as on a day-to-day basis. Strategies for this portion of Staten Island that were identified with high "likely applicability" included upland waterfront parks, in-water breakwaters, artificial reefs, and constructed breakwater islands. Shoreline seawalls were also found to have likely applicability, however the study notes that seawalls may disrupt sediment transport and lead to the erosion of beaches. As described in the *New York City Hazard Mitigation Plan* (2014), "Coastal erosion can cause extensive damage to public and private property because it brings structures closer to the water's edge. If erosion is

[1] *PlaNYC—A Stronger, More Resilient New York,* June 2013.

not mitigated, the structures will become inundated with water, resulting in damage or destruction." This report also notes that along the South Shore of Staten Island, 415 acres and 96 building "centroids" are located within the New York State Department of Environmental Conservation (NYSDEC)-mapped Coastal Erosion Hazard Areas (CEHAs)[1]. Based on this work, the Community Rebuilding Resiliency Plan for the East and South Shores of Staten Island recommended coastal protection initiatives. In particular, Coastal Protection Initiative 15 calls for the implementation of a "living shoreline project—likely to consist of oyster reef breakwaters, beach nourishment, and maritime forest enhancements—in areas adjacent to Conference House Park in Tottenville."

One New York: The Plan for a Strong and Just City (OneNYC), April 2015, the City's comprehensive strategy and policy directive to address long-term challenges related to climate change, an evolving economy, and aging infrastructure OneNYC, is overseen and implemented by the Mayor's Office of Sustainability and the Mayor's Office of Recovery and Resiliency. It incorporates and expands on all the planning work undertaken in PlanNYC as well as *A Stronger, More Resilient New York* and identifies the following three initiatives comprise Vision 4: Coastal Defense:

- Initiative 1, Strengthen the city's coastal defenses: Complete the City's $3.7 billion coastal protection plan, a program of infrastructure investments, natural area restoration, and design and governance upgrades of which nearly half is funded.
- Initiative 2, Attract new funds for vital coastal protection projects: Continue to identify and secure new sources of funds for infrastructure to reduce coastal flooding risk.
- Initiative 3, Adopt policies to support coastal protection: Align and adopt policies to support the right investments in coastal protection, and ensure those investments are operated and maintained effectively.

Among its many components, Vision 4 describes investments to improve low-lying shorelines across the city, including in the South Shore of Staten Island. Elements of the proposed Breakwaters and Shoreline Projects are specifically described in the OneNYC planning document as measures to address this policy.

REBUILD BY DESIGN

In June 2013, HUD launched Rebuild by Design, a competition to respond to Superstorm Sandy's devastation in the northeast region of the United States and promote a design-led approach to pro-active planning for long-term resilience and climate change adaptation. The winning proposals would be implemented using CDBG-DR funding as well as other public and private-sector funding sources. In June 2014, following a year-long research and design process during which the design teams met and collaborated with regional experts, government entities, elected officials, issue-based organizations, local community groups and individuals, HUD announced the winning proposals. The Staten Island Living Breakwaters Project, which proposed a resiliency approach to promote risk reduction through erosion prevention, wave energy attenuation, and enhancement of ecosystems and social resiliency, was one of the selected projects. As a result, New York State has been allocated $60 million of CDGB-DR program funds to implement the project along the Tottenville shoreline of the South Shore of Staten Island. With an ecologically enhanced breakwater system to address wave energy and shoreline erosion at Tottenville, this proposal responds to the City's Coastal Protection Initiative 15. Progress on this initiative has been tracked and reported in the OneNYC 2018 Progress Report.

NY RISING COMMUNITY RECONSTRUCTION PROGRAM

The NY Rising Community Reconstruction Program was established by New York State to provide rebuilding and revitalization assistance to communities severely damaged by Superstorm Sandy,

[1] Identification of a building's "centroid" indicates that the majority of the building is located within the CEHA.

Hurricane Irene and Tropical Storm Lee. The Tottenville Shoreline Protection Project was conceived through the NY Rising planning process, and proposes new shoreline protection features as a coastal resiliency strategy for the Tottenville area. New York State proposes to use approximately $9.3 million of CDBG-DR program funds to implement this project.

HARBOR ESTUARY AND RARITAN BAY PLANNING

Any coastal resiliency strategy proposed for Tottenville should be considered in the context of its location and its consistency with other plans or policies relevant to the area. The South Shore of Staten Island adjoins the waters of Raritan Bay, which supports a diverse community of aquatic biota, but has also been impacted by upland development and discharges that have resulted in degraded water and habitat quality, as well as sediment contamination. Once home to a rich estuarine environment, robust coastal habitat and vibrant destination for water-based recreation and other activities, the Raritan Bay and South Shore of Staten Island have suffered significant land loss and habitat degradation over the last century.

The USACE and the Port Authority of New York and New Jersey (PANYNJ) developed a Comprehensive Restoration Plan for the Hudson-Raritan Estuary (HRE CRP) in partnership with the NY-NJ Harbor & Estuary Program (HEP) with the contribution and collaboration of the U.S. Environmental Protection Agency (USEPA), U.S. Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration (NOAA), NYSDEC, Hudson River Foundation, NY/NJ Baykeeper, and other federal, state (NY and NJ), and city agencies as well as non-governmental organizations and academic and research institutions. The Plan identifies 12 Target Ecosystem Characteristics (TECs), which are used to outline strategies for ecological restoration within the Hudson-River Estuary. These TECs include wetlands; habitat for waterbirds; coastal and maritime forests; oyster reefs; eelgrass beds; shorelines and shallows; habitat for fish, crab, and lobsters; tributary connections; enclosed and confined waters; sediment contamination; public access; and acquisition. The HRE CRP specifically identifies restoration opportunities in many of the TEC categories for the study area. The Living Breakwaters project area is identified in the plan as having high suitability for oyster reef restoration. The final report was released in June 2016.

NYCDCP's *New York City Vision 2020: New York City Comprehensive Waterfront Plan* (2011) is another study that provides context for resiliency planning along the Tottenville shoreline. Vision 2020 was prepared in partnership with State and federal agencies, including NYSDEC, the Port Authority of New York and New Jersey and the U.S. Army Corps of Engineers (USACE). Among its many goals are expanded public access to the waterfront and waterways; enhancement of the public experience of the waterways that surround New York—including promoting water recreation and creating the waterfront infrastructure needed for events, cultural activities and educational programs; and identification of strategies to increase the City's resilience to climate change and sea level rise.

Providing public access along the City's coastline is also the intent of Policy 8 of the City's Waterfront Revitalization Program. This policy, along with the goals of Vision 2020, is consistent with the priorities identified by the South Shore community during its engagement with the City following Superstorm Sandy.

RAISE SHORELINES CITYWIDE STUDY

In 2014, the New York City Economic Development Corporation (NYCEDC) announced its intention to study and identify high-risk shorelines citywide that are most vulnerable to sea level rise and erosion, and then prioritize those shorelines for future design and construction of resiliency measures. This study analyzed approximately 43 miles of at-risk shoreline across the five boroughs (including the South Shore of Staten Island) with a goal to evaluate localized measures to reduce coastal risk, make recommendations for resiliency investments, and coordinate with other local coastal protection actions. As part of this coordination, coastal strategy recommendations for the area in Tottenville identified in the Raise

Shorelines Citywide Study (along the eastern stretch of Conference House Park) have been incorporated into the proposed Shoreline Project. Citywide, the Raise Shorelines budget is $100 million of which "approximately 30 percent of funding will be used to implement protection initiatives in Southern Staten Island."[1]

CITY, STATE, AND FEDERAL AGENCY COORDINATION

As noted in the City's PlaNYC Progress Report 2014:

> *In addition to moving forward its own projects, New York City took formal steps to establish a leadership role in advancing coastal protection initiatives. This involved a high level of coordination with federal and state funding and regulatory agencies including USACE, HUD, FEMA and New York State DEC. Leadership has also been established on the City level through the Coastal Protection Working Group, which brings senior level agency designees together to coordinate protection initiatives. In addition, the City has worked closely with the several federal HUD-sponsored Rebuild by Design teams and the State's New York Rising Community Reconstruction Program to ensure federal and state funded projects through these programs are aligned with and advance the City's coastal protection priorities.*

One such coordinated effort resulted in the March 2015 *Coastal Green Infrastructure Research Plan for New York City*, prepared for NYSDEC, the New England Interstate Water Pollution Control Commission (NEIWPCC) and jointly managed by the Hudson River Estuary Program, NYCDCP and New York City Mayor's Office of Recovery and Resiliency. The plan is intended to aid decision-makers as they evaluate strategies to protect New York Harbor's future. The research plan examines six coastal green infrastructure strategies (including constructed breakwaters), summarizes the latest scientific understanding of the ecological and risk reduction benefits of these strategies, and describes research needs moving forward. The overall plan is intended to inform planning to protect coastal communities, provide habitat to sustain fisheries, and provide opportunities to connect New Yorkers to their local waterfront.

3 ENVIRONMENTAL REVIEW PROCESS

The environmental review process provides a means for decision-makers to systematically consider environmental effects along with other aspects of project planning and design, to evaluate reasonable alternatives, and to identify, and mitigate where practicable, any significant adverse environmental impacts.

On behalf of the State of New York, GOSR, acting under the auspices of New York State Homes and Community Renewal's Housing Trust Fund Corporation, as the Responsible Entity in accordance with 24 CFR 58.2(a)(7) and as the lead agency responsible for environmental review, decision-making, and action under 42 U.S.C. § 5304(g), determined that the Proposed Actions have the potential to result in significant adverse environmental impacts. Therefore, at GOSR's request, HUD issued a Notice of Intent to Prepare an EIS (NOI EIS) to satisfy NEPA procedural requirements in accordance with 24 CFR Part 1502. The NOI EIS was published in the Federal Register on April 20, 2015. The EIS also satisfies the requirements of the State Environmental Quality Review Act (SEQRA), and GOSR shall serve as lead agency for purposes of SEQRA.

The Draft Scope of Work (Draft Scope) for this project was issued on April 1, 2015. The NOI EIS included notice of the public scoping session held on April 30, 2015. Oral and written comments were

[1] https://www.nycedc.com/sites/default/files/files/rfp/qa-documents/Raise%20Shorelines%20Citywide%20QA%20FINAL.pdf

received during the public scoping session. Written comments were accepted from issuance of the Draft Scope through the public comment period which ended June 15, 2015. The Final Scope of Work for the DEIS was issued on April 1, 2016 and reflected modifications due to certain design advancements since the issuance of the Draft Scope of Work as well as changes made in response to relevant public comments on the Draft Scope.

The Notice of Availability and Notice of Completion for the DEIS for the Proposed Actions was issued by GOSR on March 24, 2017. GOSR held a duly noticed public hearing on the DEIS on April 26, 2017, at Public School 6, 555 Page Avenue, Staten Island, NY 10307. The comment period remained open for receiving written comments until May 8, 2017.

On June 13, 2018, GOSR issued the joint Notice of Availability/Notice of Completion for the FEIS through publication in the New York State Environmental Notices Bulletin and newspapers of general circulation within the affected community. The Notice of Availability of the FEIS was announced in the Federal Register on June 15, 2018. The document was available for public review until July 16, 2018.

4 PROJECT PURPOSE AND NEED

PURPOSE

The purpose of the Proposed Actions is to reduce wave action and coastal erosion along the shoreline in Tottenville, while enhancing ecosystems and shoreline access, use and stewardship. This is consistent with the City's Coastal Protection Initiatives and planning studies for the Tottenville area. The proposed project goals would be achieved using a layered approach that would address wave action, impacts of coastal flooding and event-based (i.e., short-term/storm-related) and gradual (long-term) shoreline erosion, while restoring and enhancing ecosystems, improving waterfront access and engaging with the community through educational and stewardship programs directly related to the coastal resiliency actions. It is highly important that the actions both provide coastal protection and ecological enhancement, and at the same time serve as a means to engage and educate the public on local ecosystems and innovative coastal resiliency strategies in an era increasingly affected by climate change. The coastal structures associated with the Proposed Actions would be designed for a 50-year service life, though the functional life of the projects is anticipated to be longer.

The ability to meet this purpose is measured in terms of the following goals and objectives of the Proposed Actions:

- Risk Reduction
    - Attenuate wave energy;
    - Address both event-based and long-term shoreline erosion / preserve beach width; and
    - Address the impacts of coastal flooding.
- Ecological Enhancement
    - Increase diversity of aquatic habitats consistent with the Hudson-Raritan Estuary plan priorities (e.g., oyster reefs and fish and shellfish habitat).
- Social Resiliency
    - Foster community education on coastal resiliency directly tied to and building off the structural components of this resiliency initiative;
    - Increase physical and visual access to the water's edge;
    - Enhance community stewardship of on-shore and in-water ecosystems; and
    - Increase access to recreational opportunities.

NEED

Staten Island is exposed to extreme wave action and coastal flooding during hurricanes and other severe storm events due to its location at the mouth of the New York Bight, which funnels storm-driven waves into New York Harbor, Raritan Bay, and the shoreline of Staten Island. The Raritan Bay and South Shore of Staten Island was once home to a rich estuarine environment, robust coastal habitat and vibrant destination for water-based recreation and other activities. Over the last century, this area has suffered significant land loss and habitat loss/degradation. As described above, the South Shore of Staten Island is vulnerable to both event-based and gradual coastal erosion and land loss. The project area has experienced dramatic net erosion between 1978 and 2012. The greatest historic erosion rates were seen in the southern part of the project area in Conference House Park, just north of Wards Point where the erosion rate was over 3 feet per year. In general, while some small areas showed accretion, and some areas eroded less, large parts of the shoreline within the project area were eroded at rates ranging from 1 foot to over 3 feet per year (from 1978 to 2012). Some areas of accretion were observed, usually updrift of shoreline structures such as groins or storm sewer outfalls, but higher rates of erosion were generally observed down-drift of such structures. Overall, beaches in the project area have experienced an annual net loss of sediment. Narrow beaches lead to less protection for on-shore assets from wave action and coastal erosion, as well as less space for residents and visitors to enjoy the shoreline experience, and access the shoreline and nearshore waters.

5 DECISION

GOSR has selected the Alternative 2, Layered Tottenville Shoreline Resiliency Strategy: Living Breakwaters Project and Tottenville Shoreline Protection Project for the Coastal and Social Resiliency Initiatives for Tottenville Shoreline (Potential Location 3 has been selected for the Water Hub as part of this Alternative [see details below]). Implemented together, the two projects would serve as a single, integrated coastal resiliency strategy for this area. By providing two layers of coastal risk reduction, the Selected Alternative is intended to improve current shoreline erosion conditions, serve to further reduce wave action, provide for ecological enhancement and promote social resiliency.

6 ALTERNATIVES CONSIDERED

The EIS considered four alternatives for the Coastal and Social Resiliency Initiatives for Tottenville Shoreline, Alternative 1: the No Action Alternative, Alternative 2: The Layered Tottenville Shoreline Resiliency Strategy: Living Breakwaters Project and Tottenville Shoreline Protection Project, Alternative 3: Breakwaters without Shoreline Protection System and Alternative 4: Shoreline Protection System without Breakwaters. A full description of the four alternatives is located in Chapter 1, "Purpose and Need and Alternatives" of the FEIS. The EIS also describes other alternatives considered but determined not to be practicable and eliminated from further consideration.

6.1 ALTERNATIVE 1: NO ACTION ALTERNATIVE

The No Action alternative assumes that no new structural risk reduction projects or marine habitat restoration projects will be implemented in the project area. This alternative also assumes that current trends with respect to coastal conditions at Tottenville—i.e., relating to erosion, wave action, ecosystems, and water quality—will continue.

6.2 ALTERNATIVE 2 (PREFERRED ALTERNATIVE)—THE LAYERED TOTTENVILLE SHORELINE RESILIENCY STRATEGY: LIVING BREAKWATERS AND TOTTENVILLE SHORELINE PROTECTION PROJECT (LAYERED STRATEGY)

The Layered Strategy consists of the implementation of two individual projects that, when integrated as one initiative, may provide greater overall coastal risk reduction and promote social resilience. These projects were developed through separate, but related, planning initiatives arising out of the Superstorm Sandy recovery efforts. Implemented together, the projects would be planned and designed as a single, integrated coastal resiliency strategy for this area. By providing two layers of coastal risk reduction, these components, as further described below, are intended to improve current shoreline erosion conditions, serve to further reduce wave action, provide for ecological enhancement and promote social resiliency.

LIVING BREAKWATERS PROJECT (REBUILD-BY-DESIGN)

As mentioned above, the concept for the Breakwaters Project was developed as part of the HUD sponsored design competition, Rebuild by Design, from 2013 through 2015. The winning proposal included an ecologically enhanced breakwaters system that would span an approximately 13,000 linear foot stretch off the Tottenville shoreline, a community Water Hub on-shore, and programming for stewardship and citizen science. In preparation for the advancement of design, a robust data collection effort was undertaken, including, but not limited to, a bathymetric survey, site-specific sediment sampling, geotechnical boring collection, environmental/habitat surveys, and hydrographic studies. Following detailed analysis of these data and iterative modeling efforts, the design of the system was refined to the 30 percent design scenario (as described in the DEIS), and subsequently, the preliminary 60 percent scenario (as described in the FEIS). Throughout the process, the footprint of the breakwaters has reduced significantly, minimizing the potential for impacts, from the original RBD conceptual alignment of 13,000 linear feet of breakwaters, to 3,900 linear feet in the 30 percent design phase, to a total length of 3,200 feet in the preliminary 60 percent design phase. The modeling and analysis performed in the preliminary 60 percent scenario demonstrated that the goals and objectives of the Proposed Actions would be met with this much more targeted system, using groupings of breakwater structures to respond to the changing character of the shoreline, observed shoreline change patterns and the predominant storm wave direction.

The primary Breakwater Project components are described below.

Breakwaters System—One of the key components of the Breakwaters Project is an ecologically enhanced breakwater system designed to reduce wave energy at the shoreline, and prevent or reverse shoreline erosion while creating hard/structured marine habitat. The breakwater system as currently proposed (preliminary 60 percent design) would have nine breakwater segments with a total length of approximately 3,200 linear feet within Raritan Bay and would be located between approximately 790 and 1,170 feet from the shoreline. Additionally, the vast majority of the breakwater structures would be located more than 1,700 feet from the Federal Navigation Channel with the closest breakwater segment located more than 700 feet from the channel. The breakwater structures would occupy approximately 495,900 square feet (approximately 11.4 acres) on the bottom of Raritan Bay and result in the placement of 151,780 CY of rock and ecologically enhanced concrete within Raritan Bay, approximately 115,990 CY of which would be placed below mean high water (MHW). The breakwaters would be positioned and designed to optimize reduction in both wave height and shoreline erosion, while enhancing habitat and minimizing habitat displacement and navigational impacts.

The breakwaters would be rubble mound structures made of a combination of hard stone and biologically enhanced concrete armor units. While materials and the basic construction of the breakwaters would be the same across all segments, three types of breakwaters, defined largely by their differences in crest elevation (in North American Vertical Datum of 1988 [NAVD88]) and overall height, are proposed: Type A, Type B, and Type C. All would extend some height above MHW. The overall breakwater system

layout has been designed to reduce or reverse shoreline erosion along the length of the project area. Breakwater crest elevations, orientation and locations were also based on the relative need for storm wave attenuation at different locations along the shoreline.

Type A breakwaters, or "low crested" breakwaters, have been designed to prevent shoreline erosion but would have minimal impact on wave heights during severe storms. The Type A breakwaters have been designed for locations where the shoreline and assets near it are less vulnerable to storm wave action. Two segments of Type A breakwaters would be installed in the western portion of the project site near Ward's Point. These breakwaters would have a crest elevation of 5 feet NAVD88 and an overall height of 11 feet and their crests would still remain above MHW with up to 30 inches of sea level rise. Together the two segments would be approximately 900 feet long, and result in the placement of 19,940 CY in the bay, of which 18,840 CY would be below MHW within a 2.8-acre footprint.

Type B and C breakwaters have been designed to reduce risk to the portions of the shoreline most vulnerable to storm wave action. Five segments of Type B breakwaters would be installed; together these segments would be approximately 1,500 feet long, with a crest elevation of 14 feet, an overall height of 20 feet, and result in the placement of approximately 79,870 CY in the bay, of which 57,520 CY would be below MHW within a 5.7-acre footprint. Two Type C breakwaters would be installed offshore in the eastern portion of the project site. Together, these segments would be approximately 800 feet long, with a crest elevation of 14 feet, an overall height of 24 feet, and result in the placement of approximately 51,970 CY within the bay, of which approximately 39,630 CY would be below MHW within a 3.0-acre footprint. Considering up to 30 inches sea level rise, modeling indicates that these breakwaters would be able to reduce wave heights to less than 3 feet in a 100-year storm event (a severe storm of a 1-percent probability in any given year), thereby reducing event-based as well as long-term shoreline erosion and structural damage to assets on shore.

As a system, the breakwaters would be capable of reducing storm wave heights to three feet or less in up to a 100-year storm with 30 inches of sea level rise, reducing storm wave exposure to the southern shore of Staten Island. Wave attenuation provided by the breakwaters on a day-to-day basis would help to maintain beach conditions by reducing long-term beach erosion rates, reducing exposure of shoreline structures to erosion, and encouraging accretion in priority beach zones. The breakwater system would help to minimize the potential for down-drift erosion by holding sand in the system through wave energy reduction along the shoreline. At the western tip of the study area near Ward's Point, the breakwaters would likely reduce sand migration into the Federal Navigation Channel. The breakwaters were also designed to encourage shoreline growth, or accretion, in places where the beach is most narrow, as well as to reverse the pattern of historic land loss, promoting the stabilization or accretion of beach in areas of the greatest observed historic land loss.

The proposed breakwater system would increase habitat diversity through the establishment of structural habitat, which is currently limited within Raritan Bay. The breakwater structures have been designed to have varying levels of elevation, inclination, bio-enhancing materials, textures, interstitial spaces, and grain sizes in order to create a diversity of habitat characteristics for aquatic biota. The breakwaters would be primarily constructed as rubble mound (rock) structures with a bedding layer, stone core and outer layers consisting of armor stone or bio-enhancing concrete armor units. In the subtidal and intertidal areas, up to one third of the armor stone would be bio-enhancing concrete units rather than stone, creating an "enhanced" habitat surface. Certain breakwater segments would have a series of rocky protrusions or "reef ridges" that would extend approximately 65 feet seaward, generally perpendicularly from the main breakwater. These reef ridges and the narrow spaces between them, "reef streets," would add to the diversity of available habitats within the intertidal and subtidal zones, including interstitial spaces between armor units by providing pockets of complexity within the structure. These areas could generate additional opportunities for ecological enhancement.

As discussed above, the vast majority of the breakwater structures would be located more than 1,700 feet from the Federal Navigation Channel. The location of the breakwater segments would be marked in accordance with US Coast Guard requirements, and the segments would be spaced far enough apart to avoid interference with recreational boating in Raritan Bay. In addition, the breakwaters would be positioned and marked to ensure they will not interfere with any navigation activities.

Shoreline Restoration—Sand placement to restore the historic shoreline position is being proposed between Loretto Street and Manhattan Street, downdrift (southwest) of the outfall at Loretto Street, where building the beach will have the most benefit in the vicinity of elements of the proposed Shoreline Project (see below), and where the beach is currently narrow and has experienced high rates of historic erosion (around 2.0 ft/year from 1978 to 2012). At the time of sand placement, the proposed area of shoreline restoration would extend along approximately 806 feet of shoreline in an area of approximately 3.1 acres, of which approximately 2.6 acres would be below MHW (+2.08 NAVD88). About 17,404 cubic yards (CY) of sand, approximately 11,637 CY of which would be below MHW, would be placed in this location to establish a wider beach in what is currently a narrow and erosion-prone section of the beach. This 3.1-acre area was selected for one-time shoreline restoration because of high historical and projected erosion rates and narrow beach. The shoreline restoration would extend the beach at +5.0 NAVD88 by approximately 50 feet and then slope downward to meet the existing bathymetry. This one-time placement of sand would approximate the historic 1978 shoreline position, augment the accretion potential that can be provided by the breakwaters and add sediment to the overall system, particularly contributing to one of the narrowest and most erosion-prone areas of beach in the site and generally enhancing overall beach growth potential.

Water Hub—With the goal of promoting social resiliency, a proposed community Water Hub—including associated wayfinding, interpretive signage, and monitoring locations at points along the shoreline—would provide a place for access to the waterfront, orientation, education, information on shoreline resiliency, community gathering space and if located on-shore, potential equipment storage for NYC Parks maintenance. In particular, the Water Hub programming could include classrooms and labs, engaging students in waterfront education, citizen's science, oyster restoration and reef building, and cultivating long-term estuary stewardship. The educational programming for the Water Hub would directly tie to the in water components, as well as to any shoreline resiliency components of the Proposed Actions. In addition to ecological engagement, the Water Hub facilities and programs are intended to educate residents on the risks and benefits of living in the coastal environment and build awareness, preparedness and stewardship within the community. The Water Hub may also include other elements, such as, exhibition space, maintenance-related storage space and offices, and terrace space.

It should be noted that while the FEIS conservatively considered three Potential Locations for the proposed Water Hub, with this Joint ROD and Findings Statement, Potential Location 3 has been selected for implementation as part of the Proposed Actions. However, the description of each Potential Location for the Water Hub analyzed in the FEIS is included below as part of this record. Potential Location 1 would be in the vicinity of the southern terminus of Page Avenue (involving the construction of a new structure. Potential Location 2 would be in the north-western portion of Conference House Park (involving the rehabilitation and adaptive reuse of an existing NYC Parks building). Potential Location 3 would involve a "floating" Water Hub, a vessel operated by a non-profit organization (e.g., BOP). The vessel would visit the breakwater project area for education and monitoring and would be docked at existing facilities in the City.

Potential Location 1 (On-Shore)

Potential Location 1 is located in the vicinity of the southern terminus of Page Avenue. At this location, there are two options for the construction of the Water Hub. The first, Page East Option, would locate the proposed Water Hub in an existing Conference House Park parking lot and surrounding wooded area

immediately east of Page Avenue. The second, Page West Option, would use a grassy site west of Page Avenue that has previously contained a two-story NYC Parks building (which was demolished in 2016 due to substantial damage caused by Superstorm Sandy). Although the design is still being developed, the proposed Water Hub structure is anticipated to be small in scale, ranging from approximately 38-feet (potential location west of Page Avenue) to 48-feet (potential location east of Page Avenue) in height, clad in materials to enhance visual connections to the nearby waterfront areas. It would have a rooftop observation deck and solar panels. The proposed Water Hub facility is expected to include an enclosed 5,000-sf building and approximately 35,500 square feet of site improvements that would include landscaping, parking and utility spaces and designated space for the use of NYC Parks vehicles and equipment. The proposed Water Hub would also provide direct on-site waterfront access. It is anticipated that the facility would be used by the New York Harbor Foundation, NYC Parks, and local schools and community groups.

At Potential Location 1, access to the water from the shore would be provided by means of a seasonally deployed temporary floating boat launch. Anchored about a foot above MHW the approximately 8-foot-wide temporary boat launch would extend approximately 210 feet.

The Water Hub site would include parking for visitors, as well as several on-shore and near-shore landscape elements in the area of the proposed Water Hub.

Potential Location 2 (On-Shore)

Potential Location 2 is located in the north-western portion of Conference House Park. At this location, there are two options for the adaptive reuse of existing NYC Parks buildings for Water Hub programming. The first, the Biddle House Option, would locate the programming for the Water Hub within the existing Henry Hogg Biddle House (Biddle House). The Biddle House has been designated a New York City Landmark (NYCL) and in a comment letter dated November 9, 2016, the New York City Landmarks Preservation Commission (LPC) indicated that the house appears eligible for listing on the State/National Register (S/NR-eligible). The second, the Rutan-Beckett House Option, would locate the programming for the Water Hub within the existing Rutan-Beckett House which is located southwest of the Biddle House.

Similar to Potential Location 1, Potential Location 2 would include access to the water. This access would be provided in the area of one of the houses being adaptively reused for Water Hub activities. Water access would be provided with Americans with Disabilities Act (ADA) accessible pathways and ramps from the grounds of the house being adaptively reused to the beach area, and a seasonally deployed temporary floating boat launch to the water.

Parking for Water Hub activities at Potential Location 2 would be accommodated at the existing Conference House Park Visitor's Center.

Should Water Hub programming be located at Potential Location 2, a small facility to provide seating, wayfinding, interpretive elements and potential storage for kayaks and beach cleaning equipment would be constructed near the terminus of Page Avenue. This structure would be a pavilion, shed or other light structure (approximately 400 sf). This facility may be connected to the City's water supply but would not require sanitation sewer connections. The existing parking facilities at the terminus of Page Avenue would be used to access this facility. Additional wayfinding, interpretive signage, and monitoring locations would be integrated along the length of the shoreline as part of the Water Hub's educational programming.

Potential Location 3 (Off-Shore)

Potential Location 3 would involve a "floating" Water Hub, or vessel operated by a non-profit organization (e.g., BOP). The vessel would be docked at existing facilities in the City (serving local

groups and community members when docked locally) and would visit the project area approximately once per week from April through November for student based teaching events, and host community events approximately twice per month. When in the project area, the vessel would anchor near the breakwater structures for observation/monitoring and education activities. Should Water Hub programming be located at Potential Location 3, wayfinding, interpretive elements, and potential storage for kayaks would be constructed near the terminus of Page Avenue. Additional wayfinding, interpretive signage, and monitoring locations would be integrated along the length of the shoreline as part of the Water Hub's educational programming. No additional parking facilities would be required with this option. Also, because this option does not include an on-shore building for Water Hub programming, a seasonally deployed temporary floating boat launch would not be included as part of the project.

Seasonal Floating Dock—Water Hub programming located at Potential Location 1 or 2 would require a temporary seasonal floating dock measuring about 30 feet by 50 feet, with a total area of 1,500 square feet, installed near the Type C eastern breakwaters segments for observations, monitoring, maintenance and stewardship, including specifically, for vessels operated by project stewards. This floating dock would not be required for Potential Location 3, which has been selected for implementation, because education and monitoring activities could occur directly from the vessel or "floating" Water Hub.

6.3 ALTERNATIVE 3—BREAKWATERS WITHOUT SHORELINE PROTECTION SYSTEM

Alternative 3 would develop the Breakwaters Project components as described in Alternative 2, including the proposed in-water breakwaters, shoreline restoration, Water Hub elements and accessory boat launch and seasonal floating dock near the breakwaters. None of the Shoreline Project components would be developed under Alternative 3.

6.4 ALTERNATIVE 4—SHORELINE PROTECTION SYSTEM WITHOUT BREAKWATERS

Alternative 4 would develop the Shoreline Project components as described in Alternative 2, including the proposed earthen berm, hybrid dune/revetment, eco-revetments and raised edge, wetland enhancement, shoreline plantings, and maritime forest restorations. Americans with Disabilities Act (ADA) accessible pathways, access points and overlooks would be constructed along the shoreline protection system. None of the Breakwaters Project components would be developed under Alternative 4.

6.5 ALTERNATIVES CONSIDERED AND ELIMINATED

COASTAL STRATEGY ALTERNATIVES

<u>Alternatives Considered for the Breakwaters Project</u>

Rebuild by Design was a multi-stage regional design competition that analyzed potential coastal resilience strategies for sites throughout the Sandy-affected region in order to identify innovative and site-specific approaches that would be effective at reducing coastal risk and fostering broader community resilience. Living Breakwaters was a strategy developed for the South Shore of Staten Island, following an exploration of a variety of other coastal strategies.

As a part of the initial stage of the competition, a series of resilience strategies for various shallow-water environments were explored, all aimed at the ultimate project objectives to reduce risk, enhance ecologies, and foster social resilience. The effectiveness of these strategies for wave attenuation in different contexts in New York Harbor were preliminarily evaluated during the competition using the ADCIRC hydrodynamic model and SWAN wave model. However, modeling results are only one element within many that determined the potential effectiveness and appropriateness of each strategy in relation to the Tottenville community, environmental and public interest considerations, and construction and regulatory feasibility. Ultimately, the Living Breakwaters were identified for the Tottenville site based on their ability to achieve the risk reduction goals articulated in the purpose and need. Additional strategies

were also considered. While some of these alternative strategies are appropriate for some shallow water environments, they were ultimately not identified as practicable resilience strategies for this area of Staten Island for reasons described below, and were not considered further.

Beach Nourishment/Re-Nourishment (alone)

Beach nourishment is the (periodic) placement of sand on and adjacent to an existing beach into shallow waters along the shoreline to extend the shoreline and widen the beach, resulting in a beach berm. A wider beach can increase and enhance waterfront public open space and reduce the risk of upland infrastructure to ongoing erosion by providing sacrificial beach width. The beach can also provide some wave attenuation benefits for smaller, more frequent storm events as long as storm surge elevations are not significantly higher than the beach. While beach nourishment of sufficient size, if maintained (regularly re-nourished), can provide some wave attenuation and act as sacrificial erosion protection to the land behind, given the high surge elevations experienced on the south shore of Staten Island, a beach berm alone would provide little storm wave reduction benefit, and thus beach nourishment alone would not fulfill the project purpose and need. At the project site, beach nourishment is not sustainable without additional protective and stabilizing features (such as breakwaters) and would need to be regularly maintained (re-nourished) over time, resulting in periodic disturbance to beach users, wildlife and fish and benthic invertebrates during each of these sand placement events, rather than a one-time construction event. Beach nourishment/re-nourishment would not meet the risk reduction goal of addressing impacts of coastal flooding, nor the ecological enhancement goal of increasing diversity of aquatic habitats within Raritan Bay, or the social resiliency goals and objectives of the Proposed Actions. For all of these reasons, beach nourishment alone was not considered practicable and was not evaluated further.

Groins (Groins Alone or Groins Plus Beach Nourishment)

Groins are generally shore perpendicular rock or sheet pile structures designed to trap and retain sediment from longshore transport. Groins interrupt the longshore sediment transport accumulating sediment on the updrift side and depriving sediment to the downdrift side resulting in a pattern of accretion and erosion adjacent to the structure. This effect can be partly mitigated by prefilling the groin with sediment allowing more sediment to bypass the end of the structure. Groins are often constructed in groups (fields) or together with other shoreline protection measures to reduce the downdrift impacts. Groins would not meet the risk reduction goals of attenuating wave energy before it reaches the shore. While groins would address shoreline erosion, this would occur by blocking longshore transport, increasing the potential for erosion elsewhere along the shoreline. Groins would not meet the risk reduction goal of addressing impacts of coastal flooding, the ecological enhancement goal of increasing diversity of aquatic habitats within Raritan Bay, or the social resiliency goals and objectives of the Proposed Actions. For all of these reasons, groins were not considered practicable and were not evaluated further.

Constructed/Restored Wetlands

Coastal wetlands can attenuate waves and even absorb surge waters, reducing wave and coastal flooding impacts within coastal communities. Existing coastal wetlands in the New York region are threatened by development, erosion, and sea level rise inundation and require sediment replacement and nourishment to maintain and expand their protective footprints. Dredging provides a potential source for sediment that can be used to restore these coastal wetlands. Federally maintained recreational channels, such as the Intracoastal Waterway provide sources for clean dredge material that can be used for nearby larger-scale wetland restoration. At the local scale, regulatory structures can be streamlined to allow family-owned marinas to nourish wetlands adjacent to their properties, recycling sediment within the sediment shed and protecting their own waterfront facilities from damaging wave action.

In order to be effective on their own for wave attenuation and surge abatement, a wide swath of wetlands would be needed along the shoreline to absorb wave energy—studies have shown that it takes 1.3 to 3.8

miles of marsh to generate a 1-foot reduction in storm surge (USACE, 1963). Such extensive wetlands off the south shore of Staten Island would require massive amounts of fill, including infill of the federal navigation channel which would disrupt navigation into and out of the Arthur Kill, and replacement of large areas of intertidal and subtidal habitat with wetland habitat. In addition, while there is interest in variety along the shoreline and potentially pockets of living shorelines, the character of the beach is valued by local residents, and such expansive and complete change to the shoreline and nearshore to coastal wetlands would completely alter the shoreline character and ecology. Additionally, there are no small marinas or navigable waterways in the vicinity of the Tottenville shoreline south of Lemon Creek and east of Tottenville Marina that could provide a source of suitable fill material from maintenance dredging. Therefore, large quantities of suitable fill material would need to be derived from other sources, with potential impacts associated with the removal of this material. Constructed wetlands would also not meet the social resiliency goals and objectives of the Proposed Actions. For all of these reasons, constructed/restored wetlands were not considered practicable and were not evaluated further.

Sills (Sill-type Living Shorelines)

A Living Shoreline is a protected, stabilized coastal edge made of natural materials; they use plants and other natural elements—sometimes in combination with hardened shoreline structures—to stabilize estuarine coasts, bays, and tributaries. Sills are continuous low-profile breakwater structures made of stone or other material resistant to erosion and wave action. Sill-type living shorelines are low-crested structures (typically stone) placed parallel to the shore so that marsh can be planted behind them. The structures are intended to attenuate daily wave action and protect or help restore landward vegetation, typically a wetland or marsh, from wave damage and erosion. While such low crested structures in combination with vegetation establishment are effective at attenuating day-to-day waves, their low crests would mean that they are not effective at attenuating storm waves during high surge events and thus would not meet the risk reduction goals and objectives of the Proposed Actions of attenuating wave energy and addressing the impacts of coastal flooding. While sills and sill-type living shorelines would provide erosion protection, such near shore structures would also likely interrupt longshore transport processes, depriving sediment to the down drift areas, exacerbating erosion in those areas. While sill-type living shorelines would provide some near-shore rocky structure, they would be in shallow water and lack subtidal habitat and the intertidal habitat diversity provided by structures in deeper water, and would only partially meet the ecological enhancement goal and objectives of the Proposed Actions In addition, such sills would not meet the social resiliency goals of the Proposed Actions. They would not promote connectivity to the water for people as they would place dense vegetation and structure between people and the water (which may pose a public access hazard), and are not usually utilized on public beaches. While there is interest in variety along the shoreline and potentially pockets of living shorelines, the character of the beach is valued by local residents, and the extended application of these living shorelines across the project area would completely alter the shoreline character and ecology and occupy a larger footprint in the nearshore. For all of these reasons, sill-type living shorelines were not considered practicable and were not evaluated further.

Other Sills (beach sills, headland breakwaters, etc.)

Sills can also be used to stabilize and protect beach berms and form headlands. Headland Breakwaters (versus detached breakwaters such as the proposed Living Breakwaters) are low breakwaters or rock sills placed close to shore with the intent that the breakwaters connect to the shore either immediately or over time with a sand spit or "tombolo." Such breakwaters typically include initial sand placement behind them, but even without this initial placement of sand, the intent is that they will eventually be connected to the shore through the formation of a "tombolo" or sand spit between the beach and the breakwater. The breakwater structures are placed strategically along a shoreline with the understanding that the land between the structures will erode to a predicted stable bay-shape over time. Because of this, they create a heavily scalloped shoreline, with areas of eroding shoreline between the sand spit or tombolos. The beach

width at the project site is not sufficient to allow for the formation of such bays without either causing erosion of the existing or proposed onshore features or including extensive initial beach fill seaward of the existing shoreline as part of the project in order to retain an accessible public beach and avoid the potential erosion of onshore features. While such low crested structures are effective at attenuating day-to-day waves, their low crests would mean that they are not effective at attenuating storm waves during high surge events and thus would not meet the risk reduction goals and objectives of the Proposed Actions of attenuating wave energy and addressing the impacts of coastal flooding. While sills would provide erosion protection, such headlands or tombolos alter longshore transport and break it into individual littoral cells between the headlands with little sediment movement passing around the headlands. In addition, while headland breakwaters would provide some nearshore rocky structure, they would be in shallow water and connected to the land and lack subtidal habitat and the intertidal habitat diversity provided by structures in deeper water, and would only partially meet the ecological enhancement goal and objectives of the Proposed Actions. In addition, such sills and headland breakwaters would not meet the social resiliency goals of the Proposed Actions. For all of these reasons, sills were not considered practicable and were not evaluated further.

Constructed Reefs or Subtidal Breakwaters

Constructed reefs and subtidal breakwaters have successfully been installed in various coastal environments primarily to control shoreline erosion and in some cases build beaches. Some propriety subtidal breakwater systems also can provide structured habitat enhancement (such as Reef Balls, oyster castles, etc.). As these types of systems are intended to remain submerged, they do not provide significant storm wave attenuation, especially during elevated water levels, nor would they provide the erosion protection risk reduction goal and objective of the Proposed Actions. Constructed reefs or subtidal breakwaters would not meet the social resiliency goals of the Proposed Actions. Submerged structures such as these within the shallow water habitat of this portion of Raritan Bay would also have the potential to affect navigation safety. For all of these reasons, constructed reefs or subtidal breakwaters were not considered practicable and were not evaluated further.

Floating Wave Attenuators

Floating wave attenuators can be effective in reducing short period waves, typically in protected bays or harbors. They have been utilized, at least on an experimental basis, to reduce erosion and loss of wetlands due to wave action. Typically, floating breakwaters are not utilized in open coast areas where they are not effective in reducing longer period (>3 second) waves. Certain propriety floating breakwater designs may include habitat enhancing features, such as wetland plantings. During storm conditions, longer period waves (>3 seconds) occur within Raritan Bay within the project area. Therefore, floating wave attenuators would not meet the risk reduction goals and objectives. Floating wave attenuators would only partially meet the ecological enhancement goals and objectives, and would not meet the social resiliency goals and objectives of the Proposed Actions. Additionally, such structures would incur high maintenance costs. For all of these reasons, floating wave attenuators were not considered practicable and were not evaluated further.

Bay Nourishment/Shallowing

Bay nourishment, defined as the shallowing of bathymetric features, would support and replenish shallow estuarine systems that are threatened by shoreline urbanization, dredge channel creation, maritime traffic, water pollution, and continued sea level rise. Nourishing salt marshes and tidal ecosystems to their shallower water depths would have protective functions, dissipating waves and deflecting hurricane storm surges to reduce flood risks for waterfront neighborhoods. Bay nourishment, however, may potentially limit water access for vessels, change water dynamics, and alter water temperatures. Different degrees of nourishment were considered—restoring areas to their historic depths wholesale, as well as options to maintain navigability.

Nourishment is more effective in confined areas, such as Jamaica Bay. With its wide mouth, strong connection to the water flows of the Raritan and Hackensack rivers, the Raritan bay is a very different type of water body that would likely require much more extensive fill to achieve similar wave or surge reducing effects. The bathymetry of the Bay, in particular off the shoreline of Tottenville is already quite shallow from the shoreline to the federal navigation channel. The federal navigation channel, which frames the nearshore of the Tottenville project area, is an important navigation corridor and shallowing this could limit Maritime Access to the Arthur Kill. Bay nourishment/shallowing would also not meet the ecological enhancement goal and objectives of increasing aquatic habitat diversity, or the social resiliency goals and objectives of the Proposed Actions. For all of these reasons, bay nourishment/shallowing was not considered practicable and was not evaluated further.

Alternatives for the Tottenville Shoreline Protection Project

As discussed above, the Shoreline Project had its genesis in the New York Rising Community Reconstruction initiative established by Governor's Office of Storm Recovery. The program coordinated with State and Federal agencies to help guide the development of feasible projects. The plan for the South Shore of Staten Island included dunes with a stone core and sand cap, planted for stabilization, from Brighton Street to Joline Avenue. Additional coastal strategy alternatives evaluated for the Shoreline Project are discussed below.

Levee

During the design process, a levee, an alternative strategy to a dune, was evaluated for feasibility and appropriateness along the Tottenville shoreline. The evaluation determined that while a levee would provide protection from wave action and still water flooding, the structure would need to be very large in scale (at approximately an elevation of 23 feet), would be visually obtrusive, would restrict community waterfront access, would not meet the social resiliency goals and objectives of the Proposed Actions, and would be cost prohibitive. For all of these reasons, this strategy was not considered practicable and was eliminated from further consideration.

Seawalls, Bulkheads, or Ecologically Enhanced Seawalls or Bulkheads

Seawalls and bulkheads are hard structural features placed at the shoreline to stabilize the upland and prevent further erosion of the shoreline. They are typically used when there is not sufficient space available for more gradually sloped and "natural"/ecologically sensitive options. Seawalls and bulkheads tend to have greater impacts on existing habitats and disrupt existing/natural hydrologic and sediment processes. Ecologically enhanced seawalls or bulkheads (which can be referred to as absorptive edges) are modified seawalls or bulkheads designed to provide shallower slopes that expand the interface between land and water and introduce hard or soft habitat features into the structures. They are typically proposed to replace seawall and bulkhead infrastructure that has been destroyed, structurally impaired, ore deteriorated over time. This expanded interface provides more surface area for friction plantings, designed to attenuate waves and prevent erosion of the shoreline. Absorptive edges attempt to mimic coastal ecosystems and the risk reduction benefits of hard structural features while attempting to mitigate some of their negative environmental impacts. Absorptive edges are ecologically engineered with a range of materials including reinforced ecological concrete, stone, gabions, and geotextiles to prevent erosion to edges located in high velocity wave environments.

The shoreline of the south shore of Staten Island is largely beach, with a gradually sloping shoreline. With the exception of intermittent groins and one revetment, the shoreline is not currently hardened. While space between the MHW line and adjacent homes and infrastructure is at times narrow, it is generally relatively wide, providing space for beach, and often dunes and upland forest. There is a large tidal range and a wide area of intertidal beach habitat. As a hardened condition is found at only a very limited extent along the Tottenville shoreline, and there is sufficient public land adjacent to the beach and in the near

shore to explore less environmentally impactful strategies that support the project purpose and need to provide erosion reduction, wave attenuation and habitat creation, seawalls and bulkheads were not advanced as a potential strategy for the Tottenville Shoreline. Absorptive edges are also not a strategy suited for the entire project area for the reasons above, but at specific targeted locations where existing hardened structures are present, these measures may be suitable for incorporation into the design of the Shoreline Project. For all these reasons, seawalls, bulkheads, or ecologically enhanced seawalls or bulkheads were not considered practicable and were not considered further.

6.6 ENVIRONMENTALLY PREFERRED ALTERNATIVE

The Council on Environmental Quality (CEQ) regulations state that the agency in issuing its ROD shall specify the alternative or alternatives which are considered environmentally preferable. The guidance issued by CEQ indicates that the environmentally preferred alternative is the one which causes the least harm to the natural and physical environment. In this case, the No Action Alternative avoids the impacts to the natural environment caused by the construction of Alternative 2. However, the No Action Alternative does not provide risk reduction, ecological enhancement, or social resiliency, and by definition does not meet the purpose and need. A no-build action is studied to serve as a baseline and means of comparison to the build alternatives. In this case based on a thorough scoping and EIS process and consideration of alternatives, as discussed herein and in the environmental documents, Alternative 2 is deemed the environmentally preferred alternative. As discussed in the following sections, the decision to select Alternative 2 is based on a thorough and careful consideration of all the impacts, mitigation of those impacts, and accomplishing the important public interest of satisfying the purpose and need of the project.

7 IMPORTANT FACTORS IN THE DECISION MAKING PROCESS

The environmental impacts of the Selected Alternative were carefully evaluated and weighed along with social and economic factors and other considerations, such as the ability of the Preferred Alternative to provide increased resiliency for the Tottenville shoreline. The Selected Alternative meets the purpose and need of the Coastal and Social Resiliency Initiatives for Tottenville Shoreline Project and includes the following benefits as compared to the No Action Alternative.

- Risk Reduction: The Selected Alternative would attenuate wave energy, address both event-based and long-term shoreline erosion and preserve beach width, and address the impacts of coastal flooding.
- Ecological enhancement: The Selected Alternative would increase the diversity of aquatic habitats consistent with the Hudson-Raritan Estuary plan priorities (e.g., fish and shellfish habitat).
- Social resiliency: The Selected Alternative would foster community education on coastal resiliency directly tied to and building off the structural components of this resiliency initiative. It would also increase physical and visual access to the water's edge, enhance community stewardship of on-shore and in-water ecosystems, and increase access to recreational opportunities.

The economic, social, and environmental benefits of the Selected Alternative were weighed against its impacts in the analyses set forth in this section.

7.1 ENVIRONMENTAL IMPACT STATEMENT

The environmental record for the Coastal and Social Resiliency Initiatives for Tottenville Shoreline Project includes the DEIS and the FEIS, issued on March 17, 2017, and June 1, 2018, respectively, as well as comments on the FEIS, which are identified in Section 9 of this Joint ROD and Findings

Statement, and the responses annexed hereto. These documents, incorporated here by reference, constitute the statements required by NEPA (42 USC 4321 et seq) and CEQ regulations implementing NEPA (40 CFR Parts 1500 to 1508), and under authority of HUD's regulations at (CFR) § 58.2(a)(7)(i) as the Responsible Entity, and as the lead agency responsible for environmental review, decision-making, and action under 42 U.S.C § 5304(g), and under SEQRA (Article 8 (8-0101-8-0117 of the ECL and implementing regulations in 6 NYCRR Part 617). Consistent with NEPA and SEQRA, the FEIS fully and thoroughly addresses:

- The social, economic, and environmental impacts of the project;
- Measures to mitigate the environmental impacts of the project;
- The adverse environmental impacts that cannot be avoided;
- Alternatives to the proposed project; and
- Irreversible and irretrievable impacts on the environment that may be involved with the project should it be implemented.

The FEIS fully assessed the potential social, economic, and environmental impacts from construction and operation of the Selected Alternative. HUD and other federal agencies have promulgated specific methodologies and criteria to assess potential environmental impacts under NEPA, which were followed in completion of the technical analyses in the EIS. Additionally, because the project is located in New York City, New York City's *CEQR Technical Manual* served as a guide with respect to methodologies and impact criteria for evaluating the Selected Alternative's impacts.

Operational (Long-term) Impacts of the Selected Alternative

Table 1 identifies the potential environmental impacts of the Selected Alternative once it is operational (i.e., long term impacts). The FEIS identifies that operation of the Selected Alternative would result in adverse impacts to Waters of the U.S. and associated habitat. Measures to mitigate these adverse environmental impacts as well as measures to minimize or avoid impacts were identified in the FEIS and are summarized in **Section 8** below.

Table 1
Summary of Environmental Impacts—Operational Period

Environmental Resource Area	Environmental Impact
Land Use, Zoning, and Public Policy	The Selected Alternative would not result in any significant impacts to land use, zoning, and public policy in the study area. The Selected Alternative would result in the development of new resiliency, educational, and recreational infrastructure in Tottenville which would constitute compatible uses within Conference House Park and the abutting City street rights-of-way, and would be compliant with local zoning, including special districts, and with all applicable public policies. The Selected Alternative would reduce risk from coastal erosion and wave action, providing a level of protection to existing land uses in the park and upland residential areas. Likewise, this alternative would be consistent with public policy initiatives to protect the South Shore of Staten Island from coastal erosion and wave action, and would enhance local habitat and ecologies as discussed in federal, State and City plans. The Selected Alternative would not result in any adverse changes to land use, zoning or public policies.
Socioeconomic Conditions	The Selected Alternative would not result in significant adverse socioeconomic impacts. Under the Selected Alternative, two layers of coastal risk reduction would be implemented and study area residents would be less susceptible to damage by wave action and erosion. Potential increases in property value attributable to this alternative are not expected to result in significant residential displacement pressures within the study area. Market conditions already reflect the close proximity of the waterfront as a valuable residential amenity; the Selected Alternative would improve the area's amenities, but would not introduce a substantial new use that would alter market conditions. In addition, study area property values and rents historically have not discounted value based on the risk posed by major storm events. In this respect, rather than leading to substantial increases in property value and rent, the Selected Alternative would be expected to maintain pre-Sandy levels of interest, investment, and property values in the study area. In addition, approximately 80 percent of the study area's households reside in owner-occupied units, and homeowners are not vulnerable to displacement due to rent increases. Of the 20 percent of study area households who rent, most have incomes that suggest they could afford modest rent increases, and study area rents are low relative to other areas in the borough and City, suggesting a small number of residents who would be vulnerable to displacement if rents were to increase. Even if all study area renters vulnerable to displacement from rent increases were to be displaced (which is not expected), the displaced population would represent a very small portion of the overall study area population, and therefore Selected Alternative would not result in displacement that could substantially alter the socioeconomic character of the neighborhood. With respect to potential indirect business displacement, a vast majority of existing businesses are located outside of the area that would benefit from reduced risk of damage caused by wave action and erosion. Similarly, retail businesses in the study area not located within close proximity to the project area, and would not experience a substantial increase in consumer visits that in turn, could lead to increased rents. Therefore, The Selected Alternative does not have the potential to increase commercial rents in a manner that could lead to significant indirect commercial displacement.
Environmental Justice	The Selected Alternative would not result in environmental justice concerns. The Selected Alternative would produce beneficial effects for the local community, including reduced wave action and coastal erosion along the shoreline in Tottenville, and enhancement of ecosystems and shoreline access and use. In addition, the Selected Alternative includes engaging with the community through educational programs directly related to the coastal resiliency actions. At the same time, the Selected Alternative would not result in any significant adverse impacts that would result in any disproportionately high and adverse effects on minority and low-income populations. Overall, the Selected Alternative would have a positive effect on the neighboring communities by both providing coastal protection and ecological enhancement, and at the same time providing a destination for public education, and increasing awareness of local ecosystems and innovative coastal resiliency strategies in an era increasingly affected by climate change. In addition, it would be in compliance with all applicable NEPA, HUD, and state regulations related to environmental justice protections.

Table 1 (cont'd)
Summary of Environmental Impacts—Operational Period

Environmental Resource Area	Environmental Impact
Historic and Cultural Resources	The Selected Alternative would not result in significant adverse impacts with respect to historic and cultural resources during operation of the project. The architectural resources in the Areas of Potential Effect (APEs) are located significantly inland, away from the locations of most of the Shoreline Project components of the Selected Alternative. In addition, existing intervening landscaping elements and plantings, and the shoreline protection measures of the Shoreline Project further limit any visual or contextual relationships between the architectural resources in the APEs, and the locations of the Shoreline Project components. The potential of archaeological impacts during construction is discussed in Table 2 below.
Urban Design and Visual Resources	The proposed in-water system in the Breakwaters Project Area of the Selected Alternative would not result in any adverse impacts to urban design components in the Project Areas or in the larger study area. The Water Hub Potential Location 3 (selected for implementation with this Joint ROD and Findings Statement) would involve a "floating" Water Hub—a vessel that would visit the Breakwater Project Area approximately once per week from April to November for student-based teaching events, and host community events approximately twice per month. The vessel would be docked elsewhere at existing facilities in the City (outside of the project area). This option and its operations would be consistent with existing maritime operations in the area. With this option, a small structure would be constructed near the terminus of Page Avenue, and a series of wayfinding, interpretive, and monitoring elements would be located along the shoreline. Potential Location 3 would not result in any adverse urban design impacts. Views in the Breakwaters Project Area would not be adversely affected as the in-water breakwaters project components of the Selected Alternative would be located in Raritan Bay at a distance from the shoreline and are being designed to be low in scale. Because of distance and the low, linear scale of the breakwaters, and the common color and reflectance (lack of contrast) of the breakwaters to land forms in the distance, the visibility of the breakwaters would be similar to existing views of land masses that can be seen from many on-shore vantage points toward Raritan Bay. While the breakwaters would present a new visual element in these views, changes to these views would be minimal and would not impair the character or quality of locations from which visibility is possible. Nor would the visibility of the breakwaters clearly interfere with or reduce the public's enjoyment and/or appreciation of Raritan Bay. Therefore, the breakwaters of the Selected Alternative would not result in an adverse visual or aesthetic impact in views toward the waterfront and Raritan Bay, or views to any other aesthetic and visual resources, including historic architectural resources which would not be adversely affected by the breakwaters due to distance. The vessel used for the "floating" Water Hub (Potential Location 3) for the Selected Alternative would not adversely affect views toward the waterfront as the vessel would only be intermittently located within the Breakwaters Project Area, and would be similar to other vessels in Raritan Bay. Views toward the waterfront from Potential Location 3, would also be intermittent and would be limited to viewers on the Water Hub vessel toward the waterfront. While close-up views of the breakwaters would be available, the vessel itself would provide educational and monitoring facilities for visitors to the facility. A small facility that would be constructed near the terminus of Page Avenue as part of the "floating" Water Hub would be a small facility and would not adversely impact any existing views or views to any aesthetic or visual resources. In addition to this small structure, a series of wayfinding, interpretive, and monitoring elements would be located along the shoreline. Further, the Water Hub at Potential Location 3 would not adversely impact any existing views toward the waterfront and Raritan Bay, or views to any other aesthetic and visual resources, including historic architectural resources. The four primary components of the Shoreline Project would result in enhancements to shoreline access through new waterfront access points, overlooks, and walkways that would be consistent with similar existing elements. The continuous walkway that would be created along the waterfront would contribute to the pedestrian experience of the waterfront. The changes to urban design in the Shoreline Project Area would contribute new urban design elements that would create visual interest in areas near the shoreline and would enhance the pedestrian experience of the Shoreline Project Area. Therefore, the Selected Alternative would not result in any significant adverse urban design impacts to the Shoreline Project Area or study area. Views in the Shoreline Project Area would include the proposed changes to the waterfront landscape. The changes to these views would be minimal, and therefore would not result in any significant adverse impacts. The eco-revetments and raised pathways would not result in any adverse impacts to any existing views. Views from the Project Areas and study area would continue to include wide open views of Raritan Bay though some views from vantage points closest to the Project Areas would change, with some views including the distant in-water breakwaters. Other visual resources in the study area would not be affected by the components of the Selected Alternative because of distance and intervening building and natural features. The views of residents, pedestrians, motorists, bicyclists, boaters, and users of Conference House Park and study area historic resources would be minimally affected by the components of the Selected Alternative.

Table 1 (cont'd)
Summary of Environmental Impacts—Operational Period

Environmental Resource Area	Environmental Impact
Shadows	While the Selected Alternative would not include the development of an on-shore Water Hub facility, a small structure for kayak storage may be constructed near the terminus of Page Avenue. The structure for kayak storage would not substantially alter the usability of open space resources, and all vegetation that would be affected by new shadow from the structure would continue to receive enough direct sunlight to support plant vitality. Therefore, with a small structure for kayak storage at Page Avenue, the Selected Alternative would not result in a significant shadows impact on Conference House Park or any other sunlight-sensitive resource.
Hazardous Materials	There would be no potential for significant adverse impacts with respect to Hazardous Materials during operation of the Selected Alternative.
Natural Resources (Shoreline Project)	The Selected Alternative would not result in significant adverse impacts to terrestrial resources. Permanent impacts to the delineated tidal wetland (0.14 acres out of the 0.8-acre delineated wetland due to a portion of the hybrid dune/revetment, and a length of eco-revetment) would be primarily within the portion of the wetland dominated by *Phragmites australis* (phragmites, or common reed). An existing sand bridge and culvert comprising unpermitted fill (approximately 0.01 acres) would be removed in order to construct the eco-revetment which would remove an existing impediment to tidal exchange within the eastern portion of this wetland. With the removal of the sand bridge, the net change in fill within the wetland would be 0.13 acres. While the loss of a portion of the wetland would be an adverse effect, it would be offset by the enhancement of the tidal wetland plant community that would include improved tidal exchange through modification of the inlet to Raritan Bay and removal of the sand bridge, removal of phragmites from within the wetland, and restoration of a native tidal wetland plant community. The portion of the eco-revetment that would be within the wetland would be designed in consultation with the NYSDEC and the USACE to minimize adverse effects to the tidal wetland. Protection programs (e.g., transplant, and seed collection and propagation) would be developed in coordination with NYC Parks and New York State Natural Heritage Program (NYSNHP) for populations of the state-listed plant species that would have the potential to be affected by construction of the Shoreline Project: northern gamma grass (endangered), and dune sandspur (threatened). With the implementation of these measures the Selected Alternative would not result in significant adverse impacts to threatened or endangered plant species. The landscaped areas within the Shoreline Project would be maintained using Integrated Pest Management (IPM) techniques thereby substantially diminishing the need for the use of pesticides and other chemicals and minimizing adverse effects to groundwater quality. Therefore, the Selected Alternative would not result in significant adverse impacts to groundwater. Operation of the Selected Alternative would not result in significant adverse impacts to terrestrial wildlife and plant resources and would result in an overall beneficial effect on these resources. Shoreline risk reduction measures combined with the reduced shoreline erosion and wave attenuation afforded by the breakwaters system would increase resiliency of the south shore of Staten Island, and the natural resources therein, to storm events. The Shoreline Project would stabilize and protect the upland shoreline, and would incorporate green infrastructure, such as bioswales. On-shore planting with native coastal species would enhance the native coastal habitats available throughout the Shoreline Project. Enhancement of the remaining 0.66-acre portion of the approximately 0.8-acre delineated tidal wetland that would not be within the footprint of the Shoreline Project through increased tidal exchange, removal of phragmites and restoration of a native tidal wetland plant community would benefit wetland resources and wildlife that would use this wetland. The 3.1 acres of shoreline restoration (2.6 acres below MHW) would increase availability of beach habitat for coastal wildlife. The approximately 4.6 acres of native coastal vegetation that would be established within the Shoreline Project would benefit ecological communities and the wildlife that would use these habitats.

Table 1 (cont'd)
Summary of Environmental Impacts—Operational Period

Environmental Resource Area	Environmental Impact
Natural Resources (Breakwaters Project)	The Selected Alternative would result in the placement of breakwater segments within Raritan Bay. Local sediment transport rates and accretion would be altered but the natural processes would not be blocked as there would still be sediment transport along the shore and tidal circulation around the breakwaters. The breakwater segments have been designed to minimize changes to tidal flushing and water residence time in order to avoid adverse impacts to water quality. The increased width and stability of the beaches within Conference House Park would improve spawning habitat for horseshoe crabs, provide beach habitat for other organisms while protecting the shoreline against wave action and coastal erosion, and stabilize the NYSDEC littoral zone tidal wetlands and TWAA. Loss of NYSDEC littoral zone wetlands within the footprint of six breakwater segments and a small portion of a 7th segment (about 7.1 acres) and the portion of shoreline restoration below MHW (2.6 acres) would be small in comparison to the amount of unaffected NYSDEC littoral zone tidal wetlands within Raritan Bay and would not result in significant adverse impacts to the NYSDEC littoral zone wetland resources. The breakwaters (excluding the shoreline restoration) would convert approximately 11.4 acres of existing sand/gravel bottom habitat and the approximately 115,990 cubic yards (CY) of open water habitat below MHW overlying this portion of Raritan Bay to complex hard structure (a habitat that was historically present but currently scarce in Raritan Bay). This area of bottom habitat represents about 2 percent of existing sand/gravel bottom habitat and within the approximately 610-acre portion of Raritan Bay within the study area. While the breakwaters would convert a portion of open water to structured habitat, this loss would be small compared to the extensive open water habitat available within the study area and Raritan Bay as a whole. Additionally, the structures would not hinder the movement of fish and other aquatic biota through the water column, nor would they disrupt water circulation in Raritan Bay. Fish and other aquatic biota, including anadromous species and early life stages, would be able to pass (either actively or passively) around the individual breakwater segments at any given time. The conversion of sand and gravel habitat and open water habitat to structure would not occur all at once, but rather sequentially over an 11-month period (6 months in the first year and 5 months in the second year) as the breakwater segments are constructed. This habitat conversion would result in high-relief, complex, rocky reef-like habitat within the breakwater segments. By design, the breakwater system would incorporate ecological enhancements expected to benefit the target species groups identified for the project. The high-relief rocky habitat provided by the breakwaters would be designed to attract and retain habitat-creating benthic invertebrates and shellfish, including bivalves. Ecological design features of the breakwaters (i.e., varying levels of elevation, inclination, bio-enhancing materials, textures, interstitial spaces, water retaining elements, reef streets and rock size variations) would facilitate the recruitment of a rich benthic community of habitat-forming encrusting invertebrates and algae, while also providing suitable sheltering and foraging habitat for fish and benthic invertebrates. Additionally, crevices and void spaces at the interface of the breakwaters segments with the seafloor would be available for use by benthic fish and invertebrate species. In addition to the ecological enhancements, the Selected Alternative would incorporate other measures to minimize potential adverse effects to Essential Fish Habitat (EFH) and other aquatic biota. These include timing the shoreline restoration activities and breakwater construction activities to be outside spawning windows specified by National Marine Fishery Service (NMFS) (e.g., horseshoe crab and winter flounder); maintaining at least 2 feet of clearance between the bay bottom and construction vessels or working when tide levels are sufficient to keep construction barges and vessels off the bottom; constructing breakwater segments sequentially such that the habitat conversion occurs gradually; and incorporating post-construction monitoring and adaptive management. With respect to aquatic resources, the loss of approximately 3.6 acres of Waters of the U.S. and associated habitat due to the portion of the breakwaters above MHW would result in adverse impacts and would be mitigated pursuant to the Clean Water Act through measures that may include available credits from an approved mitigation bank, and restoration/enhancement of Waters of the U.S. within the Raritan Bay watershed in New York. The shoreline restoration over time would result in a net gain of intertidal habitat of approximately 0.5 acres and a net loss of subtidal (open water) habitat of approximately 0.5 acres. The conversion of open water habitat would represent a small reduction in this type of habitat in the study area within Raritan Bay, and similar habitat at equivalent water depths would continue to be available in the vicinity.

Table 1 (cont'd)
Summary of Environmental Impacts—Operational Period

Environmental Resource Area	Environmental Impact
Floodplains and Coastal Erosion Hazard Areas	The proposed breakwaters system of the Breakwaters Project would be installed within Raritan Bay off the south shore of Staten Island and the Shoreline Project would be implemented along the adjacent shoreline and in upland areas almost entirely within Conference House Park, or within Raritan Bay in the vicinity of the breakwater segments. The Selected Alternative would provide coastal resiliency in vulnerable areas along the Tottenville shoreline. While this Alternative would not prevent flooding from coastal storm events, it would attenuate wave energy and reduce wave heights within the study area, and temporarily delay flooding of inland areas during certain storm events, providing some level of risk reduction to shoreline structures within the 100-year floodplain in and adjacent to the study area. It would not have the potential to result in direct or indirect adverse impacts to the floodplain and is appropriate for siting in the 100-year floodplain; therefore, this Alternative would be consistent with Executive Order (EO) 11988. Additionally, the Selected Alternative would not adversely affect the CEHA. Instead, it would result in the enhancement of natural protective features (i.e., additional beach area resulting from the shoreline restoration) within the CEHA Natural Protective Feature Area (NPFA), while providing reduced storm surge risk to NPFAs by attenuating wave energy. A Coastal Erosion Management Permit would be required for the Shoreline Project and the shoreline restoration under the Selected Alternative.
Sewer and Water Infrastructure	The Breakwaters Project has been designed to reduce wave energy at the shoreline, and prevent or reverse shoreline erosion, without adversely affecting tidal flushing within the study area. The Breakwaters Project is not anticipated to interfere in the current functionality of the existing outfalls (maintained by NYCDEP in accordance with current maintenance practices and future practices under the NYC Stormwater Management Program Plan [Draft for public review, April 2018], to be implemented pursuant to NYC's Municipal Separate Storm Sewer Systems [MS4] permit). Therefore, the Selected Alternative is not expected to result in significant adverse impacts to the operation of the stormwater outfalls on Loretto Street, Sprague Avenue, Joline Avenue, and Bedell Avenue due to increased sedimentation of the outfalls. The Shoreline Project has been designed to reduce risk for the shoreline area of Tottenville from wave action. Comprised of a series of porous structures (earthen berm, eco-revetments, hybrid dune/revetment, and raised edge), the Shoreline Project would allow water to seep through, either from the upland side to the Raritan Bay side, or from the Raritan Bay side to the upland side; the project is not intended to prevent Raritan Bay storm surge from entering the land, nor would it retain water inland. Risk of exposure to storm surge would occur with or without the implementation of the Shoreline Project. However, with the Shoreline Project, as long as storm surge conditions do not exceed +8.0 feet NAVD88, the structures would serve to delay water inundation to the land side, based on the seepage rate calculated for the structures. Seepage through/under the structures to the land side would continue until reaching the approximate elevation of the water on the Raritan Bay side. Once the water on the bay side would begin to recede back towards MHW, the water on the land side would seep back through to the bay side. For storm surge conditions where Raritan Bay water elevation exceeds +8 feet NAVD88 (i.e., the raised edge structure would be overtopped), the volume of water behind the shoreline structures would remain in place until the water level on the bay side recedes, at which point that water would seep through the structures towards the Bay. The seepage analysis performed for the project conservatively determined that in conditions when storm surge overtops the shoreline system, the maximum amount of freestanding water retained behind the proposed shoreline structures would be approximately 28,500 cubic feet (1,056 cubic yards), and would flow back to the bay side of the project components over a period of approximately 1.5 hours or less. Any stormwater from the land side not currently managed though the City's drainage/stormwater system would seep to the bay side of the Shoreline Project elements over the same incremental drainage time of 1.5 hours or less. Any storm surge water captured by the City's drainage/stormwater system would result in a smaller volume of water on the landside of the shoreline structures that would need to flow through the structure, and the time to drain the retained water would subsequently be reduced.

Table 1 (cont'd)
Summary of Environmental Impacts—Operational Period

Environmental Resource Area	Environmental Impact
Sewer and Water Infrastructure (cont'd)	A preliminary analysis of the site conditions based on best available information indicates that that the majority of the area currently less than +8 NAVD88 would experience similar storm surge retention time under conditions with the Selected Alternative as it does under existing conditions for events that overtop the shoreline protection system. For cases that would not overtop the proposed shoreline protection system but would inundate existing topography, it is anticipated that proposed conditions will lead to overall less retention time. Additional modeling will be conducted during the detailed design phase in consultation with NYCDEP to ensure the Shoreline Project does not worsen drainage issues associated with storm surge as compared to the existing condition in the area. During extreme surge events, stormwater outfalls along the coastline may experience backflow inundation leading to flooding of inland catch basins. This backflow flooding condition along the shoreline would be experienced with or without the Shoreline Project. Its existence is a feature of the current stormwater infrastructure, which falls outside the scope of this Shoreline Project. Where stormwater outfalls intercept the Shoreline Project footprint, NYCDEP consultation would be provided to avoid potential impacts to the stormwater infrastructure. The Shoreline Project has integrated green infrastructure measures such as bioswales into the design for the eco-revetment and the raised edge where possible to minimize potential impacts to storm sewers. Other green infrastructure measures will be considered, as necessary, as design progresses. With these measures in place, runoff resulting from the Selected Alternative would not have the potential to result in significant adverse impacts the storm sewer collection system.
Transportation	Activities associated with the Selected Alternative are not expected to generate incremental traffic, transit, or pedestrian trips that would exceed the *CEQR Technical Manual* Level 1 screening analysis thresholds for any peak hour of daily operations during the weekday or weekend day. Therefore, the Selected Alternative is not expected to result in the potential for any significant adverse transportation impacts.
Air Quality	There is no potential for mobile-source impacts from the Selected Alternative. Potential Location 3 for the Water Hub would not involve a permanent on-shore facility near residential receptors nor is it expected to contribute significantly to the air quality concentrations in the vicinity of the existing facilities at which the vessel would be docked. In addition, due to the minor vehicle increments associated with the Selected Alternative, emissions would be well below the general conformity *de minimis* criteria.
Greenhouse Gas Emissions	Operational emissions for the Selected Alternative would be associated with maintenance activity and power use such as lighting for outdoor space. With the floating Water Hub, there would be no additional building energy emissions, and there would be some emissions from the operation of a larger boat. The implementation of sustainable design features that would, among other benefits, result in lower greenhouse gas emissions would ensure that the Selected Alternative would be consistent with the City and State's emissions reduction goals and other policies.
Climate Change Adaptation and Resilience	The Selected Alternative would not introduce any adverse impacts in terms of climate resilience. Rather, it would improve the resilience of the project area to coastal erosion and the impact of waves during severe coastal storm events. The Selected Alternative would be consistent with the City and State's resilience policies. While each component (in-water breakwaters and on-shore measures) would reduce wave height on its own, the combined benefit of both components would be larger than either component on its own.
Noise	The Selected Alternative, once operational, would not have the potential to result in perceptible increases in noise level at any noise receptor locations resulting from either vehicular traffic or the floating Water Hub. Consequently, the Selected Alternative would not have the potential to result in any significant adverse noise impacts.
Public Health	Operation of the Selected Alternative would not have the potential for significant adverse impacts related to public health.

Table 1 (cont'd)
Summary of Environmental Impacts—Operational Period

Environmental Resource Area	Environmental Impact
Neighborhood Character	The study area has diverse characteristics owing to the varied land uses in the vicinity of the project site. Defining features include the following: – The quiet, residential nature of the built environment. – The presence of extensive natural areas in Conference House Park, in other parks and privately owned parcels, at the waterfront, and within the waters of Raritan Bay and the Arthur Kill. – The close interweaving of the community and its natural environment, including upland and wetland areas and the surrounding water bodies. The Selected Alternative would result in the development of new resiliency, educational, and recreational infrastructure in Tottenville, and would complement and build on the existing character of the Tottenville neighborhood in numerous ways: – The Shoreline Project and new programming associated with the proposed Water Hub would generate minimal incremental traffic, transit, or pedestrian trips and would not lead to a significant change in the quiet, residential character of the neighborhood. – The linear components of the Shoreline Project system (earthen berm, hybrid dune/revetment, eco-revetments, raised edge, and overlooks at the transition nodes) would be consistent with the uses already present in Conference House Park. Plantings of native vegetation would complement existing natural features, and access and views to the waterfront would be preserved. Beaches in the neighborhood would be stabilized and, in some areas, grow as a result of these interventions, protecting these existing features from the ongoing erosion that is currently occurring. – Components of the Selected Alternative have been designed to reinforce the existing relationship between the community and natural areas. A comprehensive trail system for the park would be provided, linking its key elements to the community. The proposed Water Hub would reinforce the community's strong relationship with the natural environment and with Raritan Bay in particular and provide opportunities to learn about the environment and history of the Park and Tottenville. Programming would complement the existing nature-focused activities and events in Conference House Park. – In addition to being compatible with, complementing, and enhancing neighborhood character as described in the preceding bullets, the resiliency improvements, at the heart of the Selected Alternative protect the existing character of the neighborhood by reducing shoreline erosion and wave action, thereby reducing risk to Conference House Park and the neighborhood as a whole. Taking into consideration its effects on the contributing features of neighborhood character in Tottenville, the Selected Alternative would not have a significant adverse impact on neighborhood character. Rather, it would have a positive impact, reinforcing and protecting the character-defining features of the neighborhood.

Construction (Short-term) Impacts of the Selected Alternative

The FEIS included a detailed assessment of construction activities associated with the Selected Alternative based on the current level of engineering design, discussions with contractors, and past experience on other similar projects. While the techniques ultimately utilized for the project may vary to some degree, the FEIS presented the most likely, worst-case scenario for construction of the project. The FEIS identifies that construction of the Selected Alternative would result in a *potential* for a significant adverse archaeological resources impact (to be ascertained during future field testing or excavation). **Table 2** identifies the potential environmental impacts of the Selected Alternative during construction. Measures to mitigate these adverse environmental impacts as well as measures to minimize or avoid impacts were identified in the FEIS and are summarized in **Section 8** below.

Table 2
Summary of Environmental Impacts—Construction Period

Environmental Resource Area	Environmental Impact
Land Use, Neighborhood Character, Socioeconomic Conditions, and Open Space	Construction under the Selected Alternative—as is the case with most large construction projects—would result in temporary disruptions in the surrounding area. However, while construction activities would be evident to the local community, the temporary nature of construction would not result in any significant impacts on local land use patterns or the character of the nearby area. Construction activities would not block or restrict access to any facilities, affect the operations of any nearby businesses, or obstruct major thoroughfares used by customers or businesses. Therefore, nearby businesses would not be significantly affected by the construction activities under the Selected Alternative. Although portions of Conference House Park would temporarily be closed during construction of the on-shore elements of the Selected Alternative, access to the waterfront in areas not under construction would continue to be maintained. Construction activities would be phased to minimize the duration of construction at any particular location within Conference House Park. As project components are completed, those sections of the park would be re-opened for use. As such, at any particular time during construction, the majority of Conference House Park and other open space resources in the area would continue to accommodate the largely passive activities displaced from the affected construction areas. Therefore, construction under the Selected Alternative would not result in significant adverse impacts on open space.
Historic and Cultural Resources	Implementation of the Breakwaters component of the Selected Alternative will not result in impacts to archaeologically sensitive depths (between 25 and 35 feet below the Raritan Bay floor). Also, the shoreline restoration component of the Selected Alternative will have no adverse effect on archaeological resources since it would involve only the deposition of sand with no in-ground disturbance, which will serve to protect archaeological resources from continued erosion. A Phase 1B archaeological investigation was recommended for those areas of archaeological sensitivity (identified in the Phase 1A study conducted for the Selected Alternative) within that will be impacted by the Selected Alternative. All Phase 1B testing within the previously identified areas of archaeological sensitivity will be completed in consultation with SHPO, LPC, and the Tribal Nations. Any additional archaeological investigation or consultation with the consulting parties will be completed pursuant to the terms outlined in the Programmatic Agreement executed in May 2013 among the Federal Emergency Management Agency (FEMA), SHPO, the New York State Office of Emergency Management, the Delaware Nation, the Delaware Tribe of Indians, the Shinnecock Nation, the Stockbridge-Munsee Community Band of Mohicans, LPC, and ACHP and specifically pursuant to Appendix D to the Programmatic Agreement, which pertains to the Community Development Block Grant-Disaster Recovery (CDBG-DR) grant program for activities in New York City. Any additional archaeological investigations completed subsequent to the Phase 1B investigation (e.g., a Phase 2 archaeological survey or Phase 3 Data Recovery) will be completed prior to construction in consultation with SHPO, LPC, and the Tribal Nations. Pursuant to Section 106 and CEQR, should significant (e.g., National Register-eligible) archaeological resources be identified in sensitive areas through Phase 1B and Phase 2 archaeological investigations, disturbance or removal of such resources through construction would constitute an adverse effect under Section 106 and a significant adverse impact under CEQR. However, as outlined above, at this time only the potential for archaeological resources has been identified in certain locations on the project site. As set forth in the 2014 *CEQR Technical Manual*, a "site's actual, rather than potential, sensitivity cannot be ascertained without some field testing or excavation." Therefore, it is conservatively assumed for purposes of Section 106 and CEQR that the Selected Alternative could potentially result in an adverse effects and significant adverse impacts, with the actual presence of any significant resources to be determined through additional archaeological investigations and consultation as set forth in the Programmatic Agreement, described above. However, should no significant archaeological resources be identified through Phase 1B or any subsequent Phase 2 archaeological investigations, and LPC, SHPO, and the Tribal Nations concur with the conclusions of those investigations, no actual adverse effects or significant adverse impacts would occur.
Visual Resources	Construction equipment such as excavators, loaders, barges, and/or trucks, would be utilized during the construction period under the Selected Alternative and may be visible to the public from certain vantage points. Views towards the waterfront from inland locations on nearby local streets are limited to residents, pedestrians, motorists and bicyclists, due to the narrowness of the streets and intervening natural features, including wooded areas, street trees, and landscaping elements on residential properties. Construction activities would be temporary in nature and would be phased to minimize the duration of construction at any particular location so as to lessen the effects of construction on the surrounding communities. Although the character and quality of views during construction may be modified, such effects would be temporary in any given location. Therefore, construction under the Selected Alternative would not result in significant adverse impacts to visual resources.

Table 2 (cont'd)
Summary of Environmental Impacts—Construction Period

Environmental Resource Area	Environmental Impact
Hazardous Materials	Although no significant potential for adverse impacts related to hazardous materials would be anticipated given the longstanding recreational parks use of the project site, the potential would be further minimized by incorporating best practices into the project's construction and incorporating the following protocols into the Selected Alternative (via the construction documents and specifications): – If evidence of contaminated soil/sand (e.g., stains or odors) is encountered, these materials (and all other materials requiring off-site disposal) would be segregated and disposed of in accordance with applicable federal, state and local regulations. If any underground storage tanks (USTs) are encountered, they would be properly assessed, closed and removed in accordance with state and local regulatory requirements (including the NYSDEC tank registration and spill reporting requirements). Any materials intended for off-site disposal would be tested in accordance with the requirements of the receiving facility. Transportation of these materials would be in accordance with federal, state and local requirements covering licensing of haulers and trucks, placarding, truck routes, manifesting, etc. – Dewatering is not anticipated to be required. Should it be needed, testing would be performed to ensure compliance with proper regulatory discharge requirements (New York City Department of Environmental Protection [NYCDEP] for discharge to combined sewers or NYSDEC requirements for discharges to surface water either directly or via an outfall). If required by the regulatory permit/approval process, pre-treatment would be conducted prior to the discharge. With the implementation of these protocols, no significant adverse impacts related to hazardous materials would result from construction activities related to the Selected Alternative.
Natural Resources	The Selected Alternative would not result in significant adverse impacts to terrestrial or aquatic resources. Temporary impacts to water quality, NYSDEC littoral zone tidal wetlands and tidal wetland adjacent area (TWAA) due to upland construction activities associated with the Selected Alternative would be minimized through the use of erosion and sediment control measures (e.g., silt fencing and hay bales) implemented in accordance with Stormwater Pollution Protection Plan (SWPPP) prepared for the project as required by State Pollutant Discharge Elimination System (SPDES) General Permit GP-0-15-002 for Stormwater Discharges from Construction Activity. These same erosion and sediment control measures would minimize potential impacts to the delineated wetland, along with the use of marsh mats or low ground-pressure equipment to minimize indirect impacts to the portion of the wetland not directly affected by the construction of the eco-revetment and hybrid dune/revetment, under the Selected Alternative. For the Selected Alternative, which would result in substantial upland construction activity, including the upland areas where threatened or endangered plant species were observed and where the box turtle (species of section concern) has the potential to occur, protection programs (e.g., transplant, and seed collection and propagation) would be developed in coordination with NYC Parks and New York State Natural Heritage Program (NYSNHP) for populations of the state-listed plant species that would have the potential to be affected by construction of the Shoreline Project: northern gamma grass (endangered), and dune sandspur (threatened). Additionally, any eastern box turtles encountered in the area of disturbance prior to or during the construction of the earthen berm, eco-revetment, and hybrid dune/revetment would be relocated to an area beyond the silt fencing to avoid direct impacts. Construction of project elements requiring tree clearing (e.g., earthen berm) would be scheduled to occur outside the early May through July primary bird breeding season, to the extent practicable. Should construction activities requiring tree clearing be necessary during April or August (i.e., the beginning and end of the breeding period), GOSR will coordinate with the USFWS with respect to conducting active nest surveys that may support tree cutting during this period. These surveys would be focused on the presence of active nests, eggs, or young in trees targeted for removal. In the event that active nests, eggs, or young are not present, GOSR will inform USFWS of the results before commencing any tree cutting. With the implementation of these measures the Selected Alternative would not result in significant adverse impacts to terrestrial threatened or endangered plant species and species of special concern. Excavation of soils to construct the on-shore components of the Selected Alternative, including the unpermitted fill determined to meet the NYSDEC Soil Cleanup Objectives (SCOs) for residential use and protection of groundwater, would not have the potential to adversely affect groundwater due to soil contamination. Groundwater removed during any dewatering activities would be treated prior to discharge to Raritan Bay and would not have the potential to adversely affect water quality.

Table 2 (cont'd)
Summary of Environmental Impacts—Construction Period

Environmental Resource Area	Environmental Impact
Natural Resources (cont'd)	During placement of the breakwater materials under the Selected Alternative, measures would be implemented to minimize suspension of bottom sediment. Increases in suspended sediment that would result from in-water construction activities would be minor, temporary, and localized, would dissipate upon cessation of the sediment disturbing activities, and would not adversely affect aquatic biota. Fish, threatened or endangered species (such as Atlantic sturgeon and sea turtles), and mobile benthic invertebrates would be expected to avoid the portions of the bay in which in-water activities would be occurring, moving to similar available habitat nearby. Increased vessel traffic and underwater construction noise would be within the range of typical vessel activity in Raritan Bay and would not adversely affect aquatic resources. Shading of aquatic habitat due to construction barges would be temporary and would not result in adverse effects to aquatic biota. In order to minimize potential effects to horseshoe crabs due to the shoreline restoration, the placement of sand would be scheduled to avoid the peak spawning season for horseshoe crabs (April 15th through July 15). Construction of the breakwaters and shoreline restoration would also be scheduled to avoid winter flounder spawning (January 1 through May 31).
Floodplains and Coastal Erosion Hazard Areas	The floodplain within and adjacent to the study area is affected by coastal flooding and would not be affected by construction or regrading/filling of the floodplain as would occur within a riverine floodplain. While a Coastal Erosion Management Permit would be required for construction of the Selected Alternative within the CEHA that are considered regulated activities under 6 NYCRR 505 (i.e., a small portion of the hybrid dune/revetment, transition nodes, one eco-revetment, raised edge, and shoreline restoration), the design for each element is generally in conformance with CEHA regulations.
Sewer and Water Infrastructure	During the placement of sand for shoreline restoration (an element of the Breakwaters Project), measures would be implemented to protect the existing stormwater outfall in Raritan Bay at the end of Loretto Street. During construction of the Shoreline Project, measures developed in consultation with New York City Department of Environmental Protection (NYCDEP) would be implemented to protect the stormwater outfalls at the end of Loretto Street, Sprague Avenue, Joline Avenue and Bedell Avenue from the physical impact of the additional sand and associated additional loads that would be placed on these outfalls. Additionally, construction of the Shoreline Project would be undertaken in accordance with erosion and sediment control plans and best management practices (e.g., silt fencing and hay bales) incorporated into the SWPPP prepared for the Selected Alternative under the SPDES General Permit GP-0-15-002 for Stormwater Discharges from Construction Activity and would not result in adverse impacts to storm sewers. The floating Water Hub would not result in discharge of sanitary waste to any wastewater system within the study area. Therefore, construction of the Selected Alternative would not result in significant adverse impacts to stormwater infrastructure.
Transportation	Incremental traffic, transit, and pedestrian trips during peak construction activities would not exceed the *CEQR Technical Manual* analysis thresholds for any hour for the Selected Alternative. Therefore, the Selected Alternative would not result in any significant adverse traffic, parking, transit, or pedestrian impacts during construction.
Air Quality	Measures would be taken to minimize pollutant emissions during construction in accordance with all applicable laws, regulations, and building codes. These measures would include dust suppression measures, idling restrictions, and the use of ultra-low sulfur diesel (ULSD) fuel and best available technologies (BAT) for equipment at the time of construction. With these measures in place, construction activities associated with the Selected Alternative would not result in any significant adverse air quality impacts. The annual emissions generated during the construction activities associated with the Selected Alternative would be lower than the *de minimis* rates defined in the general conformity regulations.
Noise and Vibration	Noise resulting from construction associated with the Selected Alternative could result in exceedances of CEQR Technical Manual noise impact criteria at beachfront residences between Swinnerton Street and Page Avenue as well as at open spaces such as the Lenape Playground located to the northwest of the earthen berm phase of the Shoreline Project. Exceedances at a single receptor are expected to last for less than 6 months, and construction equipment noise levels would decrease as the Shoreline Project progresses throughout the approximately 15 month schedule. Although the exceedances of CEQR noise impact criteria would be noticeable and potentially intrusive at times, due to the limited duration of construction activities associated with the Selected Alternative, they would not be considered significant adverse construction noise impacts. Significant adverse impacts from vibrations are not expected to occur as a result of construction associated with the Selected Alternative.

Indirect and Cumulative Impacts of the Selected Alternative

Indirect Effects

The Selected Alternative would not induce additional growth, or result in other direct impacts to land use, zoning, or public policy. It would occur on land owned by the City (NYC Parks) or New York City Department of Transportation (NYCDOT), and on underwater lands owned by NYC Parks and the State.

They would be consistent with the existing passive recreational and educational uses within Conference House Park and within the NYCDOT Surf Avenue right-of-way and would not add new uses, new public water, sanitary or storm sewer infrastructure, would not add new residents or employment that could induce additional development or support uses as retail establishments to serve new residents. Therefore, the Selected Alternative would not have a growth inducing effect.

The Selected Alternative would have the potential to result in enhanced open space resources within Conference House Park and reduce risks of property damage from wave action and erosion but would not be expected to result in increases in property value that would result in significant residential displacement pressures within the vicinity of the project area because market conditions already reflect the close proximity of the waterfront as a valuable residential amenity and historically have not discounted value based on the risk posed by major storm events, therefore pre-Sandy levels of interest and investment would be maintained. Most (approximately 80 percent) of the households in the vicinity of the project area are owner occupied units and the socioeconomic character of the neighborhood would not be substantially altered if a small (renter) portion of the overall study area population were displaced due to increased rents. Because the vast majority of existing businesses are located outside of the area that would benefit from reduced risk of damage caused by wave action, and no retail businesses are located in close proximity to the project area, the Selected Alternative would not have the potential to result in indirect business displacement or result in a substantial increase in consumer visits that in turn, could lead to increased rents.

The Selected Alternative would not have the potential to result in indirect effects to architectural resources within the Indirect Effect APE as these resources are located significantly away from most of the project components and existing landscaping elements and plantings would further limit any visual or contextual relationships between the architectural resources in the Indirect Effect APE and the project components.

Construction of the breakwaters (material placement and vessel movement) would result in minor increases in suspended sediment that would be localized and temporary. These indirect effects would not be significant and would not adversely affect other areas of Raritan Bay. Temporary indirect impacts to portions of the 0.8-acre delineated tidal wetland due to the construction of a portion of the hybrid dune/revetment and eco-revetment would be minimized through the use of measures such as marsh mats or low ground-pressure equipment within the wetland, and installation of erosion and sediment control measures in accordance with the SWPPP prepared as required under the SPDES General Permit GP-0-15-002 for Stormwater Discharges from Construction Activity. Portions of the wetland disturbed during construction would be restored as necessary (e.g., repair of ruts, stabilization of soil, revegetating). With these measures in place, temporary indirect impacts to wetlands due to construction would not result in significant adverse effects to the delineated wetland. Erosion and sediment control measures (e.g., silt fencing and hay bales) implemented in accordance with SWPPP prepared for the project as required by the SPDES General Permit GP-0-15-002 for Stormwater Discharges from Construction Activity would minimize indirect impacts to Raritan Bay and NYSDEC littoral zone tidal wetlands due to erosion and discharge of sediment during construction of the Shoreline Project.

The breakwater structures have been designed to minimize changes to tidal flushing and water residence time, and subsequently water quality and aquatic biota, of Raritan Bay within the Project area. The breakwaters will attenuate waves and alter sediment transport along the shore to maintain and restore the beach but would minimize down-drift impacts1. The spacing, orientation, and design of the breakwaters

[1] Down-drift erosion–when a headland, inlet, river, bay, canyon, reef or shoal blocks the natural longshore drift of materials, such as sand and gravel, by waves and currents, resulting in accumulation of sediments on the up-drift side, while a depletion of material occurs on the down-drift side (Bruun 1995).

would minimize the potential indirect and down-drift impacts of altered sedimentation and would not hinder the movement of fish and other aquatic biota through the water column. The breakwaters would not cause erosion or result in increased wave heights on adjacent areas. The breakwaters would result in indirect impacts to the subtidal and intertidal habitats and NYSDEC littoral zone tidal wetlands due to the gradual sedimentation along the shoreline but have been located and spaced so that they would not result in the indirect impact of tombolos (connection to the shore). While they would create small changes in flow around the structures, the breakwaters would not significantly disrupt existing currents in Raritan Bay. Scour at the perimeter of the breakwater structures would be very localized, within 15 feet of the ends of the breakwater. The increased shoreline stability and accretion provided by Alternatives 2 and 3, including the shoreline restoration between Manhattan Street and Loretto Street, would likely result in a beneficial indirect impact to spawning horseshoe crabs and other organisms that use beach habitat, as well as to people using Conference House Park.

The ecologically enhanced breakwaters would facilitate the recruitment of a rich benthic community of habitat-forming encrusting invertebrates and algae, while providing suitable sheltering and foraging habitat for fish and benthic invertebrates that occur in Raritan Bay, resulting in beneficial impacts to target species groups of Raritan Bay. The Shoreline Project would not have the potential to result in indirect impacts to natural resources.

The Breakwaters Project is not anticipated to interfere in the current functionality of the existing outfalls (maintained by NYCDEP in accordance with current maintenance practices and future practices under the NYC Stormwater Management Program Plan [Draft for public review, April 2018], to be implemented pursuant to NYC's Municipal Separate Storm Sewer Systems [MS4] permit). Additionally, the Shoreline Project has integrated measures such as bioswales into the design for the eco-revetment and the raised edge where possible to minimize potential impacts to storm sewers. Therefore, the Selected Alternative would not result in adverse indirect impacts to sewer and water infrastructure.

Collectively, activities associated with the Water Hub and the Shoreline Project are not expected to generate incremental traffic, transit, or pedestrian trips that would result in any significant adverse transportation impacts, direct or indirect, or any associated indirect impacts to air quality.

Cumulative effects

Projects or actions that represent past, present and reasonably foreseeable future actions and their impacts to environmental, socioeconomic and cultural resources in the future have been evaluated as appropriate and considered in the assessment of the potential impacts from the Selected Alternative in each technical analysis. These actions included past projects such as the establishment of Conference House Park, the Federal Navigation Channel and installation of temporary dunes. Present and future projects included: reconstruction of the Conference House Park Pavilion and maritime forest restoration within Conference House Park; City-wide initiatives such as Vision 2020, New York City's Green Infrastructure Plan, OneNYC and MillionTreesNYC that focus on expanding usage of green infrastructure, reducing stormwater runoff, and increasing public access to the waterfront; regional restoration plans such as the Hudson-Raritan Estuary Comprehensive Restoration Plan, Billion Oyster Project, and New York/New Jersey Baykeeper intended to benefit natural resources of the estuary; and the USACE South Shore of Staten Island Coastal Storm Risk Management project.

The Selected Alternative would have a beneficial effect on Conference House Park as it would reduce the risk of wave action and coastal erosion along Park's shoreline and result in improved amenities along the shoreline. The Selected Alternative would remove and replace the temporary dune system. Most of the breakwater structures would be more than 1,700 feet from the Federal Navigation Channel, with the closest segment within 700 feet, and would not, therefore, have the potential to result in cumulative impacts to the navigation channel.

In general, the present and future actions considered would complement and be consistent with the Selected Alternative, or have the potential to result in positive cumulative impacts. The reconstruction of the Pavilion concurrent with construction activities associated with the Selected Alternative would not have the potential to result in cumulative impacts to open space or wildlife resources due to the distance (at least 0.6 miles) between the Pavilion and the Shoreline Project and Breakwaters Project (at least 0.6 miles), or to transportation, air quality or noise. Habitat improvements resulting from regional restoration plans, continued implementation of fisheries management plans would complement the establishment of the ecologically enhanced breakwater structures designed to attract and retain habitat-creating benthic invertebrates and shellfish, including bivalves. The breakwaters would provide complex hard substrate that would serve as refugia and foraging habitat for juvenile fish, consistent with the goals of the HRE-CRP. The breakwaters would offer sheltering and/or foraging habitat for HRE-CRP target species, including black sea bass, striped bass, American eel, and blue crab, and the one-time shoreline restoration could enhance spawning habitat for horseshoe crab. The intertidal and emergent portions of the breakwaters would also provide some habitat for waterbirds. There would be an increase in foraging opportunities for designated EFH species and other organisms due to the establishment of encrusting organisms, macroalgae, and benthic macroinvertebrates on and among the breakwaters, and the survival of these organisms would be aided by the continued improvements in water quality. Stabilization of the shoreline and reduction or reversal of erosion that would result from the Selected Alternative would be consistent with efforts to restore and protect coastal habitats in Raritan Bay (e.g., wetland restoration, coastal forest protection, marsh improvements) and would be in line with the goals of the HRE-CRP. Stabilization of the shoreline and reduction or reversal of erosion that would result from the Selected Alternative would be consistent with efforts to restore and protect coastal habitats in Raritan Bay (e.g., wetland restoration, coastal forest protection, marsh improvements) and would be in line with the goals of the HRE-CRP.

7.2 FEDERAL REGULATIONS

SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT

The analysis in the FEIS was prepared in accordance with Section 106 of the National Historic Preservation Act of 1966 (NHPA), as implemented by the federal regulations appearing in 36 CFR § 800, in consultation with the New York State Office of Parks, Recreation, and Historic Preservation (OPRHP), acting in its capacity as the New York State Historic Preservation Office (SHPO), the Advisory Council on Historic Preservation (ACHP), the New York City Landmarks Preservation Commission (LPC), and other Consulting Parties.

In May 2013, a Programmatic Agreement was executed among FEMA, SHPO, the New York State Office of Emergency Management, the Delaware Nation, the Delaware Tribe of Indians, the Shinnecock Nation, the Stockbridge-Munsee Community Band of Mohicans, LPC, and ACHP as a result of Hurricane Sandy. This Programmatic Agreement ensures that Federal disaster assistance programs in the State of New York are administered in accordance with certain stipulations to satisfy FEMA's Section 106 responsibilities. Other Federal agencies providing financial assistance for the type of disaster assistance programs covered by the Agreement may, with the concurrence of ACHP, FEMA, and SHPO, satisfy their Section 106 responsibilities by accepting and complying with the terms of the Agreement. GOSR has agreed to accept the terms and conditions of the Programmatic Agreement via Appendix D to the Programmatic Agreement and to take into account the effects of its undertakings and satisfy its Section 106 responsibilities for the CDBG-DR program for activities in New York City.

GOSR issued a notice in the Federal Register on April 20, 2015, advising the public of the preparation of an EIS and initiating the Section 106 process. In addition to GOSR, participants in Section 106 consultation include SHPO, LPC; and representatives from four Tribal Nations, including the Delaware

Nation, the Delaware Tribe of Indians, the Shinnecock Nation, and the Stockbridge-Munsee Community Band of Mohicans.

A Draft Scope of Work (DSOW) for the EIS was submitted to the consulting parties in 2015 and subsequently revised. In comment letters dated April 7, 2015, and May 1, 2015, LPC concurred with the initial and revised DSOW, as did SHPO in comments submitted through CRIS on February 24, 2015 and the Stockbridge Munsee Community Band of Mohican Indians in a comment letter dated August 20, 2015.

Pursuant to Section 106 of the NHPA, a Draft Phase 1A Archaeological Documentary Study (Draft Phase 1A) for the project was prepared was submitted to the reviewing agencies and Section 106 consulting parties in August 2016. In comments transmitted on October 20, 2016, the Stockbridge Munsee Community Band of Mohicans concurred with the conclusions and recommendations of the Draft Phase 1A; comments were not received from the other Tribal Nations consulted. In a comment letter dated October 26, 2016, LPC concurred with the conclusions and recommendations of the draft Phase 1A Study. In a comment letter dated November 1, 2016, SHPO concurred with the conclusions and recommendations of the draft Phase 1A Study and also requested minor revisions to the Draft Phase 1A. A final version of the Phase 1A (Final Phase 1A) was prepared in May 2017 and was submitted to SHPO, LPC, and the Tribal Nations for review and comment. The Final Phase 1A recommended a Phase 1B archaeological investigation for those areas of archaeological sensitivity within the relevant areas of potential effect (APEs) that would be impacted by the project. In two comment letters, both issued on May 30, 2017, LPC concurred with the conclusions and recommendations of the Final Phase 1A Study and requested that Phase 1B testing occur after the finalization of project plans in order to better define the scope of archaeological testing. In a comment letter dated June 7, 2017, SHPO also concurred with the conclusions and recommendations of the Final Phase 1A Study. Letters of concurrence with the Final Phase 1A Study were also issued by the Delaware Nation and the Stockbridge Munsee Community on May 30, 2017 and by the Delaware Tribe on June 15, 2017.

It is conservatively assumed for purposes of Section 106 that the Selected Alternative could *potentially* result in an adverse effects and significant adverse impacts, with the actual presence of any significant resources to be determined through additional archaeological investigations and consultation as set forth in the Programmatic Agreement, described above. However, should no significant archaeological resources be identified through Phase 1B or any subsequent Phase 2 archaeological investigations, and LPC, SHPO, and the Tribal Nations concur with the conclusions of those investigations, no actual adverse effects or significant adverse impacts would occur.

EXECUTIVE ORDER 11990, PROTECTION OF WETLANDS

The project was reviewed for compliance with Executive Order 11990, Protection of Wetlands. The Selected Alternative would result in unavoidable permanent impacts to 0.14 acres of a 0.8-acre delineated wetland, which is primarily dominated by the invasive common reed. Removal of an existing sand bridge and culvert comprising 0.01 acres of unpermitted fill will result in a net change in fill within the wetland of 0.13 acres. While the loss of a portion of the wetland would be an adverse effect, it would be offset by the enhancement of the tidal wetland plant community that would include improved tidal exchange through modification of the inlet to Raritan Bay and removal of the sand bridge, removal of phragmites from within the wetland, and restoration of a native tidal wetland plant community. The portion of the eco-revetment that would be within the wetland would be designed in consultation with the NYSDEC and the USACE to minimize adverse effects to the tidal wetland.

NATIONAL FLOOD INSURANCE ACT OF 1968 (44 CFR §59) AND FLOODPLAIN MANAGEMENT EXECUTIVE ORDER 11988

Development in floodplains defined by Federal Emergency Management Agency (FEMA) mapping is regulated at the federal level by the Floodplain Management EO 11988 and National Flood Insurance Act of 1968 (44 CFR § 59). EO 11988 requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. Title 24, Subtitle A Part 55 of the Code of Federal Regulations (24 CFR § 55) contains the U.S. Department of Housing and Urban Development's (HUD) regulations implementing the requirements of EO 11988 and EO 11990, Protection of Wetlands, and the eight-step decision making process for making determinations on compliance with this Executive Order.

Portions of the Selected Alternative would be located within the 100-year floodplain. The placement of sand for the shoreline restoration would not adversely affect flood elevations or increase risks due to flooding in areas adjacent to the project area. The eco-revetment and portion of the hybrid dune/revetment within the delineated tidal wetland, like the remaining portions of the Shoreline Project, are functionally dependent on being located in the floodplain and would provide protection for upland areas from wave energy and erosion. While the eco-revetment and portion of the hybrid dune/revetment adjacent to the delineated wetland would include construction in the floodplain, these elements, along with the remaining portions of the Shoreline Project, would provide coastal resiliency in vulnerable areas along the Tottenville shoreline. While this Alternative would not prevent flooding from coastal storm events, it would attenuate wave energy and reduce wave heights within the study area, and temporarily delay flooding of inland areas during certain storm events, providing some level of risk reduction to shoreline structures within the 100-year floodplain in and adjacent to the study area. It would not have the potential to result in direct or indirect adverse impacts to the floodplain and is appropriate for siting in the 100-year floodplain; therefore, this Alternative would be consistent with Executive Order (EO) 11988.

ENDANGERED SPECIES ACT OF 1973 (16 USC §§ 1531-1544)

The Endangered Species Act of 1973 recognizes that endangered species of wildlife and plants are of aesthetic, ecological, educational, historical, recreational, and scientific value to the nation and its people. The Act provides for the protection of critical habitats on which endangered or threatened species depend for survival. The Act also prohibits the importation, exportation, taking, possession, and other activities involving illegally taken species covered under the Act, and interstate or foreign commercial activities.

As threatened and endangered wildlife and fish species were identified within the area near the Selected Alternative, GOSR entered into consultation with the USFWS and NMFS regarding the potential for Selected Alternative to affect these protected species. Informal consultation with NMFS under Section 7 of the ESA was initiated on April 19, 2017. This consultation process was completed on May 19, 2017, with a concurrence from NMFS with GOSR's conclusion that the Selected Alternative is not likely to adversely affect the ESA-listed species and/or designated critical habitat under NMFS jurisdiction. Consultation with USFWS was initiated on April 17, 2017, and was completed on January 17, 2018 with a concurrence from USFWS with GOSR's conclusion that the Selected Alternative is not likely to adversely affect ESA-listed species under USFWS jurisdiction.

CLEAN WATER ACT (33 USC §§ 1251-1387)

The objective of the Clean Water Act, also known as the Federal Water Pollution Control Act, is to restore and maintain the chemical, physical, and biological integrity of the waters of the United States. It regulates point sources of water pollution, such as discharges of municipal sewage, industrial wastewater, and stormwater runoff; the discharge of dredged or fill material into navigable waters and other waters;

and non-point source pollution (e.g., runoff from streets, construction sites, etc.) that enter water bodies from sources other than the end of a pipe.

- Section 404 of the Act requires authorization from the Secretary of the Army, acting through the USACE, for the discharge of dredged or fill material into waters of the United States. Activities authorized under Section 404 must comply with Section 401 of the Act. All permit applications submitted to USACE, including those submitted for a Department of Army permit under Section 404 of the Clean Water Act, must undergo a public interest review in accordance with 33 CFR Part 320.4.
- Under Section 401 of the Act, any applicant for a federal permit or license for an activity that may result in a discharge to navigable waters must provide to the federal agency issuing a certificate (either from the state where the discharge would occur or from an interstate water pollution control agency) that the discharge would comply with Sections 301, 302, 303, 306, 307, and 316 (b) of the Clean Water Act. Applicants for discharges to navigable waters in New York must obtain a Section 401 Water Quality Certificate from the NYSDEC.

The installation of the breakwater segments, the one-time shoreline restoration, and the components of the Shoreline Project within the 0.8-acre delineated tidal wetland require permit authorization from the USACE. The Selected Alternative will require a permit from the USACE under Section 10 of the Rivers and Harbors Act. It is consistent with the criteria for being in the public interest pursuant to 33 CFR Part 320.4. There is no practicable alternative that would avoid this disturbance to Waters of the U.S. and completely meet the purpose and need of the project. Measures implemented during construction of the Breakwaters Project would minimize the potential for temporary impacts to water quality. The design of the breakwaters would have negligible, if any, impact on water circulation and flushing and thus water quality within the study area. The loss of approximately 3.6 acres of Waters of the U.S. and associated habitat due to the portion of the breakwaters above MHW would result in adverse impacts and would be mitigated pursuant to the Clean Water Act through measures that may include available credits from an approved mitigation bank, and restoration/enhancement of Waters of the U.S. within the Raritan Bay watershed in New York. The Selected Alternative is consistent with the criteria for being in the public interest pursuant to 33 CFR Part 320.4.

SECTION 10 OF THE RIVERS AND HARBORS ACT OF 1899

Section 10 of the Rivers and Harbors Act of 1899 requires authorization from the Secretary of the Army, acting through USACE, for the construction of any structure in or over any navigable water of the United States, the excavation from or deposition of material in these waters, or any obstruction or alteration in navigable waters of the United States. The Selected Alternative will require a permit from the USACE under Section 10 of the Rivers and Harbors Act. It is consistent with the criteria for being in the public interest pursuant to 33 CFR Part 320.4. The vast majority of the breakwater structures will be located more than 1,700 feet from the Federal Navigation Channel with the closest breakwater segment located more than 700 feet from the channel and will be spaced far enough apart so as not to interfere with the movement of shallow draft vessels outside the Channel. It is anticipated that the U.S. Coast Guard will require navigation aids at the breakwaters to provide visibility to mariners as is typically done for these types of structures. The type and location of the navigation aids will be provided in accordance with federal regulations for the structure's classification. The Breakwaters Project will not interfere with navigation for commercial shipping in the Federal Navigation Channel, and will have minimal effects on the movement of smaller boats through the Bay.

MAGNUSON-STEVENS ACT (16 USC §§ 1801-1883)

Section 305(b)(2)-(4) of the Magnuson-Stevens Act outlines the process for the NMFS and the Regional Fishery Management Councils (in this case, the Mid-Atlantic Fishery Management Council) to comment

on activities proposed by federal agencies (issuing permits or funding projects) that may adversely impact areas designated as essential fish habitat (EFH). EFH is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (16 USC §1802[10]). Adverse impacts on EFH, as defined in 50 CFR 600.910(A), include any impact that reduces the quality and/or quantity of EFH. Adverse impacts may include: direct impacts, such as physical disruption or the release of contaminants; indirect impacts, such as the loss of prey or reduction in the fecundity (number of offspring produced) of a managed species; and site-specific or habitat-wide impacts that may include individual, cumulative, or synergetic consequences of a federal action.

The breakwater structures of the Selected Alternative would result in the conversion of 11.4 acres of existing sandy/gravel bottom and overlying open water habitat below MHW to complex hard structure. By design, the breakwater system would incorporate ecological enhancements expected to benefit the target species groups identified for the project. The high-relief rocky habitat provided by the breakwaters would be designed to attract and retain habitat-creating benthic invertebrates and shellfish, including bivalves. Ecological design features of the breakwaters (i.e., varying levels of elevation, inclination, bio-enhancing materials, textures, interstitial spaces, water retaining elements, reef streets and rock size variations) would facilitate the recruitment of a rich benthic community of habitat-forming encrusting invertebrates and algae, while also providing suitable sheltering and foraging habitat for fish and benthic invertebrates and would provide EFH for structure-oriented species. Species that require soft-bottom habitat for foraging (e.g., flounder and skates) would continue to forage over substrate that would be available among and in the vicinity of the breakwaters. Additionally, macroinvertebrates and small structure-oriented fish species expected to colonize the breakwaters would provide added foraging opportunities. The breakwater segments have been designed to have varying levels of elevation and inclination, along with bio-enhancing materials, and varying textures and rock gradation in order to create a diversity of habitat characteristics and sheltering opportunities for aquatic biota. Reef ridges and reef streets incorporated into the breakwater layout would create interspaces of narrow rocky conditions, providing niche spaces for sheltering fish. Aquatic species would have sheltering opportunities within the spaces created by these features over the entirety of the breakwater structures and among the segments themselves. Additional long-term beneficial effects would likely accrue to the local benthic invertebrate and fish community from the increased habitat diversity and water quality improvements from the establishment of a self-sustaining, viable mollusk population on the hard substrate of the breakwater system. The Selected Alternative would result in a loss of approximately 3.6 acres of Waters of the U.S. and associated habitat that would no longer be available to aquatic organisms due to the portion of the breakwater structures above MHW. This loss would result in adverse impacts to aquatic resources and would be mitigated pursuant to the Clean Water Act through measures that may include available credits from an approved mitigation bank, and restoration/enhancement of Waters of the U.S. within the Raritan Bay watershed in New York. GOSR initiated consultation with NMFS for EFH on April 11, 2017. As per NOAA's final EFH consultation letter dated May 8, 2018, NOAA/NMFS has concluded that "the revised EFH assessment adequately evaluates how the project components, both individually and cumulatively, will affect federally managed species, their EFH, and the ecology of Raritan Bay."

MIGRATORY BIRD TREATY ACT (50 CFR 10, 20, 21, EXECUTIVE ORDER 13186)

The Migratory Bird Treaty Act (MBTA) of 1918 was implemented following the 1916 convention between the U.S. and Great Britain (on behalf of Canada) for the protection of birds migrating between the U.S. and Canada. Subsequent amendments implemented treaties between the U.S. and Mexico, Japan, and the former Soviet Union. The MBTA makes it unlawful to pursue, hunt, take, capture, kill or sell birds listed therein. Over 800 species are currently protected under the Act. The statute applies equally to both live and dead birds, and grants full protection to any bird parts, including feathers, eggs, and nests. To minimize potential effects to migratory bird species, any tree clearing would be scheduled outside the early May through July primary bird breeding season, to the extent practicable. Should construction

activities requiring tree clearing be necessary during April or August (i.e., the beginning and end of the breeding period), active nest surveys would be conducted in coordination with the USFWS to support tree cutting during this period.

EXECUTIVE ORDER 12898, ENVIRONMENTAL JUSTICE

An analysis of environmental justice is included in Chapter 4 of the FEIS consistent with Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." The analysis in the FEIS concludes that the Selected Alternative would produce beneficial effects for the local community, including reduced wave action and coastal erosion along the shoreline in Tottenville, and enhancement of ecosystems and shoreline access and use. In addition, the Selected Alternative includes engaging with the community through educational programs directly related to the coastal resiliency actions. At the same time, the Selected Alternative would not result in any significant adverse impacts that would result in any disproportionately high and adverse effects on minority and low-income populations. Overall, the Selected Alternative would have a positive effect on the neighboring communities by both providing coastal protection and ecological enhancement, and at the same time providing a destination for public education, and increasing awareness of local ecosystems and innovative coastal resiliency strategies in an era increasingly affected by climate change. The Selected Alternative would be in compliance with all applicable NEPA, HUD, and state regulations related to environmental justice protections.

7.3 STATE REGULATIONS

CONFORMITY WITH NEW YORK STATE AIR QUALITY PLANS

Conformity for federally assisted, funded, permitted, and approved projects must be analyzed according to the general conformity regulations (40 CFR Part 93 Subpart B). The analysis of general conformity in the FEIS concluded that the Selected Alternative would result in a minor increase in emissions from mobile and stationary sources and emissions would be well below the general conformity *de minimis* criteria. Temporarily, during construction, there would be emissions associated with on-site construction equipment and with the transport of construction materials. The annual emissions would be lower than the *de minimis* rates defined in the general conformity regulations. Since all diesel engines will be using ultra low sulfur diesel, SO2 emissions would be negligible.

PROTECTION OF WATERS/401 WATER QUALITY CERTIFICATION, ARTICLE 15, TITLE 5, NEW YORK ECL, IMPLEMENTING REGULATIONS 6 NYCRR PART 608

NYSDEC is responsible for administering the Protection of Waters Act and regulations to govern activities on surface waters (rivers, streams, lakes, and ponds). The Protection of Waters Permit Program regulates five different categories of activities: disturbance of stream beds or banks of a protected stream or other watercourse; construction, reconstruction, or repair of dams and other impoundment structures; construction, reconstruction, or expansion of docking and mooring facilities; excavation or placement of fill in navigable waters and their adjacent and contiguous wetlands; and Water Quality Certification for placing fill or other activities that result in a discharge to waters of the United States in accordance with Section 401 of the Clean Water Act.

In accordance with 6 NYCRR §608.7, the Selected Alternative has been designed to: minimize adverse effects on aquatic and terrestrial biota, water quality, hydrology, and water course and waterbody integrity; and to safeguard life and property, to incorporate good engineering design and construction techniques, the safe commercial and recreational use of the Raritan Bay resources, and the natural resource management objectives and values of Raritan Bay. While the breakwaters would convert a portion of sand/gravel and open water to structured habitat, the habitat converted will be small compared to the extensive open water habitat available within the study area and Raritan Bay as a whole. Additionally, the structures will not hinder the movement of fish and other aquatic biota through the water

column, nor will they disrupt water circulation in Raritan Bay. Fish and other aquatic biota, including anadromous species and early life stages, would be able to pass (either actively or passively) around the individual breakwater segments at any given time. Measures that would be implemented to minimize the potential for adverse impacts to aquatic resources during construction include placement of geotextile to minimize sediment resuspension, using clean materials to construct project elements, and maintaining at least 2 feet of clearance between the bottom of construction vessels and the bottom of Raritan Bay during all tide phases, and timing construction to avoid winter flounder spawning (January 1 through May 31) and horseshoe crab spawning (April 15 through July 15). Additionally, the breakwaters have been designed to minimize changes to tidal flushing and water residence time in order to avoid adverse impacts to water quality.

TIDAL WETLANDS ACT (ARTICLE 25, ECL, IMPLEMENTING REGULATIONS 6 NYCRR PART 661)

Tidal wetlands regulations apply anywhere tidal inundation occurs on a daily, monthly, or intermittent basis. In New York, tidal wetlands occur along the tidal waters of the Hudson River up to the salt line and along the saltwater shore, bays, inlets, canals, and estuaries of Long Island, New York City, and Westchester County. NYSDEC administers the tidal wetlands regulatory program and the mapping of the state's tidal wetlands. A permit is required for almost any activity that would alter wetlands or the adjacent areas (up to 300 feet inland from wetland boundary or up to 150 feet inland within New York City).

Through informal consultation with NYSDEC, GOSR has concluded, that the shoreline restoration is compatible with the NYSDEC Tidal Wetlands use guidelines for Use Category 30 Filling in 6 NYCRR 661.5 and meets the standards for issuance of permits, as found in 6 NYCRR Part 661.9(b). Similarly, the placement of the breakwater structures within 7.1 acres if NYSDEC littoral zone tidal wetlands will also meet the other standards for issuance of tidal wetlands permits. The enhancement of the delineated wetland adjacent to the earthen berm and hybrid dune/revetment due to increased tidal exchange, removal of phragmites, and planting of native saltmarsh vegetation will benefit wetland resources within the project area. The Shoreline Project would enhance the habitats within the NYSDEC tidal wetland adjacent area through the establishment of native dune vegetation and other native coastal plant species and would not adversely affect the function of the TWAA to protect NYSDEC littoral zone tidal wetlands. The Selected Alternative is also compatible with the public health and welfare; complies with the development restrictions in 6 NYCRR §661.6; and complies with the use guidelines in 6 NYCRR §661.5.

COASTAL EROSION HAZARD AREAS LAW (ARTICLE 34, ECL, IMPLEMENTING REGULATIONS 6 NYCRR PART 505)

The Coastal Erosion Hazard Areas (CEHA) Law authorizes NYSDEC to identify and map coastal erosion hazard areas and to regulate certain activities and development within those areas under 6 NYCRR Part 505. A coastal erosion management permit is required for construction or placement of a structure, or any action or use of land which materially alters the condition of land, including grading, excavating, dumping, mining, dredging, filling or any disturbance of soil. NYSDEC is currently updating CEHA boundaries; however, updated CEHA maps are not yet available. The FEIS uses the maps currently available for Staten Island, dated November 10, 1988. The Selected Alternative would reduce or reverse shoreline erosion and reduce the risk of wave action to the shoreline and would not adversely affect the CEHA by reducing or reversing current erosion rates, increasing beach widths within the project area, or through additional shoreline protective features. It would result in the enhancement of natural protective features within the CEHA Natural Protective Feature Area (NPFA) while providing reduced storm surge risk to NPFAs by attenuating wave energy.

ENDANGERED AND THREATENED SPECIES OF FISH AND WILDLIFE; SPECIES OF CONCERN (6 NYCRR PART 182.6)

The Endangered and Threatened Species of Fish and Wildlife, Species of Special Concern Regulations prohibit the taking, import, transport, possession, or selling of any endangered or threatened species of fish or wildlife, or any hide, or other part of these species as listed in 6 NYCRR Part 182.6. Under these regulations, adverse modification of occupied habitat of endangered or threatened species is prohibited without authorization from NYSDEC. In response to a request for information on state-listed species and significant natural communities, the New York Natural Heritage Program (NYNHP) provided non-historical records from within 0.5 miles of the project site for a number of species. Of these, the only listed wildlife species that were observed within the study area during wildlife surveys on May 18 and June 9, 2015 were osprey (special concern) and common tern (threatened), which were both seen passing overhead or offshore from the project site. Four additional species were considered to have the potential to occur within the study area on the basis of their habitat associations: eastern mud turtle (endangered), eastern box turtle (special concern), eastern fence lizard (threatened), and southern leopard frog (special concern). The analyses in the FEIS concluded that the construction and operation of the Selected Alternative would not adversely affect any population of these species potentially occurring in the area.

COASTAL MANAGEMENT PROGRAM

After enactment of the federal Coastal Zone Management Act, the New York State Department of State (NYSDOS) developed a Coastal Management Program (CMP) and enacted implementing legislation (Waterfront Revitalization and Coastal Resources Act) in 1981, with the purpose of achieving a balance between economic development and preservation, thus promoting waterfront revitalization and water-dependent uses and protecting open space, scenic areas, and public access to the shoreline, fish, wildlife, and farmland. The program also aims to minimize significant adverse effects to ecological systems, erosion, and flood hazards. The Selected Alternative would be located in the Coastal Area as designated by the New York State Waterfront Revitalization of Coastal Areas and Inland Waterways Act (Article 42 of the Executive Law, as implemented by 19 NYCRR 600.5). New York City's Local Waterfront Revitalization Program (WRP) consists of 10 major policies, each with several objectives focused on improving public access to the waterfront; reducing damage from flooding and other water-related disasters; protecting water quality, sensitive habitats, such as wetlands, and the aquatic ecosystem; reusing abandoned waterfront structures; and promoting development with appropriate land uses. Since the entirety of the study area lies within the City's coastal zone and the Selected Alternative requires federal, state, or local discretionary action, a detailed assessment of the project's consistency with the WRP was completed. The assessment concluded that the Selected Alternative would be fully consistent with the applicable WRP policies.

NEW YORK STATE SMART GROWTH PUBLIC INFRASTRUCTURE POLICY ACT

Under the New York State Smart Growth Public Infrastructure Policy Act, no state infrastructure agency shall approve, undertake, support, or finance a public infrastructure project, unless, to the extent practicable, the public infrastructure project is consistent with its ten smart growth infrastructure criteria. The smart growth criteria are intended to limit sprawl, maximize efficiency, and promote environmentally- and socially-conscious development. It was concluded that this publicly supported infrastructure project complies with the state policy of maximizing the social, economic, and environmental benefits from public infrastructure development. The project will not contribute to the unnecessary costs of sprawl development, including environmental degradation, disinvestment in urban and suburban communities, or loss of open space induced by sprawl. Therefore, the Preferred Alternative would be fully consistent with the Smart Growth Public Infrastructure Policy Act.

8 ENVIRONMENTAL COMMITMENTS

As presented in Tables 1 and 2, the Selected Alternative would result in:

- a *potential* for a significant adverse archaeological resources impact (to be ascertained during future field testing or excavation),
- adverse impacts from the loss of approximately 3.6 acres of Waters of the U.S. and associated habitat due to the portion of the breakwaters above MHW

Mitigation measures to address these impacts as well as other measures to minimize and avoid impacts are described below. All of the following commitments have been adopted.

8.1 HISTORIC AND CULTURAL RESOURCES

Archaeological Resources

It is conservatively assumed for purposes of Section 106 and CEQR that the Selected Alternative could *potentially* result in an adverse effects and significant adverse impacts, with the actual presence of any significant resources to be determined through additional archaeological investigations and consultation as set forth in the Programmatic Agreement. However, should no significant archaeological resources be identified through Phase 1B or any subsequent Phase 2 archaeological investigations, and the New York City Landmarks Preservation Commission (LPC), the New York State Historic Preservation Office (SHPO) and the Tribal Nations concur with the conclusions of those investigations, no *actual* adverse effects or significant adverse impacts would occur.

As mandated by Section 106 of the National Historic Preservation Act of 1966 (NHPA), the Governor's Office of Storm Recovery (GOSR) is participating in an ongoing consultation process with SHPO, LPC, and the Tribal Nations with respect to potential effects on archaeological and architectural resources. As part of this ongoing process, measures have been explored to avoid, minimize, or mitigate any significant adverse effects to archaeological and architectural resources. Development of these measures is set forth in the Programmatic Agreement executed in May 2013 among the Federal Emergency Management Agency (FEMA), SHPO, the New York State Office of Emergency Management, the Delaware Nation, the Delaware Tribe of Indians, the Shinnecock Nation, the Stockbridge-Munsee Community Band of Mohicans, LPC, and Advisory Council on Historic Preservation (ACHP) and specifically outlined within Appendix D to the Programmatic Agreement, which pertains to the New York State's Community Development Block Grant-Disaster Recovery (CDBG-DR) program for activities in New York City.

The Programmatic Agreement describes the measures to be implemented and the consultation that is required during the project's design process, to avoid, minimize, or mitigate adverse effects of the project on historic and archaeological resources. GOSR would implement the various provisions of the Programmatic Agreement and would continue to consult with the consulting parties regarding the identification of the potential for the Selected Alternative to impact archaeological resources and GOSR would perform additional archaeological investigations as required. If significant archaeological deposits are identified and impacts on such deposits cannot be avoided, these would be considered unavoidable adverse impacts. GOSR would identify and implement any additional measures that may be required to mitigate adverse effects on archaeological resources in accordance with applicable Project Review provisions in the Programmatic Agreement.

8.2 HAZARDOUS MATERIALS

Although no significant potential for adverse impacts related to hazardous materials would be anticipated given the longstanding recreational parks use of the project site, the potential would be further minimized by incorporating best practices into the project's construction and incorporating the following protocols into the Selected Alternative (via the construction documents and specifications):

- If evidence of contaminated soil/sand (e.g., stains or odors) is encountered, these materials (and all other materials requiring off-site disposal) would be segregated and disposed of in accordance with applicable federal, state and local regulations. If any underground storage tanks (USTs) are encountered, they would be properly assessed, closed and removed in accordance with state and local regulatory requirements (including NYSDEC tank registration and spill reporting requirements). Any materials intended for off-site disposal would be tested in accordance with the requirements of the receiving facility. Transportation of these materials would be in accordance with federal, state and local requirements covering licensing of haulers and trucks, placarding, truck routes, manifesting, etc.
- Dewatering is not anticipated to be required. Should it be needed, testing would be performed to ensure compliance with proper regulatory discharge requirements (New York City Department of Environmental Protection (NYCDEP) for discharge to combined sewers or NYSDEC requirements for discharges to surface water either directly or via an outfall). If required by the regulatory permit/approval process, pre-treatment would be conducted prior to the discharge.

8.3 NATURAL RESOURCES

The Selected Alternative would not result in significant adverse impacts to terrestrial natural resources within the study area. The loss of approximately 3.6 acres of waters of the U.S. and associated habitat due to the portion of the breakwaters above MHW would result in adverse impacts. Measures to mitigate this impact, as well as measures incorporated into the Selected Alternative to minimize or avoid adverse impacts to natural resources include:

- Segregating any contaminated soil/or sand, creosote-treated wood or other contaminants encountered during construction and disposing of these materials in accordance with applicable federal, state and local regulations.
- Groundwater recovered during dewatering would be tested and treated in accordance with NYSDEC requirements prior to discharge to Raritan Bay.
- Implementing erosion and sediment control measures and stormwater management measures in accordance with the Stormwater Pollution Protection Plan (SWPPP) prepared as required under the New York State Pollutant Discharge Elimination System (SPDES) General Permit GP-0-15-002 for Stormwater Discharges from Construction Activity.
- Incorporating bioswales and other green infrastructure stormwater management measures to allow infiltration of runoff and recharge to groundwater.
- Relocating any eastern box turtles encountered in the area of disturbance prior to or during the construction of earthen berm to an area beyond the silt fencing to avoid direct impacts.
- Scheduling the construction of the project elements requiring tree clearing outside the early May through July primary bird breeding season, to the extent practicable. Should construction activities requiring tree clearing be necessary during April or August (i.e., the beginning and end of the breeding period), GOSR will coordinate with the USFWS with respect to conducting active nest surveys that may support tree cutting during this period. These surveys would be focused on the presence of active nests, eggs, or young in trees targeted for removal. In the event that active nests, eggs, or young are not present, GOSR will inform USFWS of the results before commencing any tree cutting.
- Maintaining landscaped areas within the Shoreline Project and at the Water Hub using Integrated Pest Management (IPM) techniques.
- In the event that piping plovers or other beach-nesting birds are found to nest on the beach, NYC Parks would enact appropriate management and protection protocols.

- In the event that the Selected Alternative results in an increase in red knot along the beach within Conference House Park in response to greater horseshoe crab spawning activity, NYC Parks would enact management and protection protocols in consultation with USFWS and any other relevant regulatory agencies.
- Employing measures to minimize impacts to the 0.8-acre tidal wetland during construction of the Shoreline Project such as marsh mats or low ground-pressure equipment, and installation of erosion and sediment control measures in accordance with the SWPPP.
- In consultation with NYSDEC and the USACE, designing the portion of the eco-revetment that crosses through the 0.8-acre tidal wetland to allow access across the wetland while minimizing adverse effects to the tidal wetland.
- Enhance the 0.8-acre tidal wetland through increased tidal exchange with Raritan Bay, removal of the unpermitted sand bridge, removal of phragmites, and re-establishment of native saltmarsh plant species. Existing native salt marsh vegetation that is currently within the wetland would be retained to the extent possible, and individual plants and seeds would be collected for preservation and replanting. Additional native saltmarsh plants would be re-established through seeding or planting plugs to supplement the native saltmarsh vegetation that already occurs in the wetland. Post-construction monitoring would be conducted in accordance with the New York State Salt Marsh Restoration and Monitoring Guidelines.
- Planting native coastal plant species within the Shoreline Project and Water Hub (if located on-shore).
- Developing protection programs (e.g., transplant, and seed collection and propagation) in coordination with NYC Parks and New York State Natural Heritage Program (NYSNHP) for populations of the state-listed plant species that would have the potential to be affected by construction of the Shoreline Project: northern gamma grass (endangered), and dune sandspur (threatened).
- Designing the Breakwaters Project to reduce wave energy at the shoreline, and reduce, prevent or reverse shoreline erosion, without adversely affecting tidal flushing along the shoreline within the NYSDEC littoral zone tidal wetland.
- Incorporating ecological enhancements into the design of the breakwater segments through the creation of three-dimensional hard/rocky structured reef-like habitat with reef streets and eco-enhanced concrete units that would increase the quantity and diversity of the aquatic habitats available for habitat forming plants and invertebrates found in Raritan Bay.
- Maintaining at least 2 feet of clearance from the bottom of the Bay, or work only at tide levels sufficient to keep construction barges and vessels off the bay.
- Mitigating for the loss of approximately 3.6 acres of Waters of the U.S. and associated habitat due to the portion of the breakwaters above MHW through measures that may include the purchase of available credits from an approved mitigation bank, and restoration/enhancement of Waters of the U.S. within the Raritan Bay watershed in New York.
- Use of best management practices to minimize the release of suspended sediments during sand placement, including placement of the material above MHWS at low tide where possible and using turbidity barriers where feasible.
- Timing the placement of sand for the shoreline restoration to avoid the spawning season for horseshoe crabs (restricted from April 15 through July 15). The material used for restoration would be similar in composition to existing sand substrate at the beach and within Conference House Park.

- Timing the construction of the breakwaters and shoreline restoration to minimize adverse effects to winter flounder early life stages and EFH (restricted from January 1 through May 31).
- Construction of the breakwater segments sequentially, such that only a small footprint of the Bay is affected at a time. As each segment is completed, habitat forming organisms would begin to colonize the structure, providing foraging opportunities for predator species.
- Development of a post-construction monitoring plan and adaptive management plan in consultation with NYSDEC, NMFS and USACE to assess use of breakwaters segments by target species groups and fish and benthic communities adjacent to the breakwaters structures.
- Development of a post-construction monitoring and adaptive management plan to assess the structural integrity and condition of breakwater structures, their effectiveness at attenuating storm waves and reducing shoreline erosion, along with establishing what corrective measures may be needed should an issue arise and when such corrective measures should be implemented. Future determination of any need for modification(s) to the breakwater structures would be in accordance with the Adaptive Management Plan developed for the project.
- To minimize human sea mammal interaction, signage indicating that such interaction is prohibited will be installed near the breakwaters in consultation with State and Federal Agencies.

8.4 SEWER AND WATER INFRASTRUCTURE

The Selected Alternative would not result in significant adverse impacts to wastewater and stormwater infrastructure within the study area; therefore, no mitigation is needed. Measures incorporated into the Selected Alternative to minimize adverse impacts to stormwater infrastructure include:

- Implementing erosion and sediment control measures and stormwater management measures in accordance with the SWPPP prepared as required under the SPDES General Permit GP-0-15-002 for Stormwater Discharges from Construction Activity.
- Incorporating permeable pathways where practicable and bioswales and other green infrastructure stormwater management measures to allow infiltration of runoff.
- Continuing to coordinate with NYCDEP to ensure the Breakwaters Project does not interfere with the current functionality of the existing outfalls maintained by NYCDEP.
- Incorporating measures to protect the stormwater outfall in Raritan Bay at the end of Loretto Street during the placement of sand for shoreline restoration.
- Incorporating any measures necessary, developed in consultation with NYCDEP, to protect the stormwater outfalls at the end of Loretto Street, Sprague Avenue, Joline Avenue, and Bedell Avenue, from the physical impact of the additional fill and associated additional loads that would be placed on these outfalls.

8.5 MONITORING/ENFORCEMENT/ON-GOING COORDINATION

The environmental commitments will be monitored by GOSR and/or its agents, and other appropriate federal, state, and local agencies to ensure conformance. Agency and stakeholder coordination will continue during project development, design and the permit process. Construction monitoring and enforcement programs will be implemented and included in contract documents to verify that construction contractors carry out project construction in accordance with contract provisions and design plans, required permit conditions, adopted environmental commitments and mitigation requirements. GOSR will be the agency responsible for overseeing the construction of the Selected Alternative.

A firm with maritime construction experience will serve as an owner's representative providing guidance and oversight of the construction process for the Breakwaters Project. After construction completion, the

breakwaters will be turned over to NYSDEC. NYSDEC will own and take full responsibility for maintenance and monitoring of the breakwater structures.

NYC Parks will both own and manage the structures that are constructed as part of the Shoreline Project. Elements of the Shoreline Project will be monitored by NYC Parks on a routine basis through the city-wide Waterfront Inspection Program managed by the EDC, in accordance with EDC's inspection manual, to determine whether repairs would be necessary. NYC Parks owns and operates Conference House Park and will be the responsible agency for long-term management of the wetland enhancement site. Pre- and post-enhancement monitoring activities will be conducted.

9 COMMENTS ON THE FEIS

The cover sheet of the FEIS was signed by GOSR on June 1, 2018. On June 13, 2018, GOSR issued the joint Notice of Availability/Notice of Completion for the FEIS through publication in the New York State Environmental Notices Bulletin and newspapers of general circulation within the affected community. The Notice of Availability of the FEIS was announced in the Federal Register on June 15, 2018. The document was available for public review until July 16, 2018. During the public review period, written comment letters and emails were received from federal, state and local agencies, elected officials, organizations, and the public. New or substantive comments on the project are addressed in **Attachment A** of this Joint ROD and Findings Statement. In summary, comments were received on: public involvement, project design details and alternatives, flooding and erosion, navigation concerns relating to the placement of the breakwaters, safety concerns regarding the pathway, potential changes in property value, and quality of life impacts to residents near the project area. The letters and emails also reiterated comments provided previously. A list of commenters is provided in **Attachment B** and **Attachment C** provides the comments received on the FEIS.

10 CONCLUSION

Having carefully considered the environmental record noted above, the mitigation measures as required herein, the written and oral comments offered by other agencies and the public on this record, and the written responses to the comments, GOSR has determined that (1) adequate opportunity was offered for the presentation of views by all parties with a significant economic, social, or environmental interest; (2) fair consideration has been given to the preservation and enhancement of the environment and to the interests of the communities in which the Selected Alternative is located; (3) all reasonable steps have been taken to minimize adverse environmental impacts of the Selected Alternative; and (4) where adverse impacts remain, there exists no feasible and prudent alternative to avoid or further mitigate such impacts.

On the basis of the careful evaluation and weighing of environmental impacts with social, economic and other considerations as presented, and the mitigation measures proposed in the Coastal and Social Resiliency Initiatives for Tottenville Shoreline FEIS and this Joint ROD and Findings Statement, as well as the written and oral comments offered by the public and public agencies, GOSR determines in accordance with 24 CFR Part 58 and 6 NYCRR Part 617 the following:

- The requirements of 24 CFR Part 58 and 6 NYCRR 617 have been met as the DEIS and FEIS were duly prepared under NEPA, and the FEIS is sufficient to make findings under 6 NYCRR Part 617.11 as permitted by 6NYCRR 617.15;
- Consistent with social, economic and other essential consideration, from among the reasonable alternatives available, the Selected Alternative is one that avoids or minimizes adverse environmental impacts to the maximum extent practicable and that adverse environmental impacts will be avoided or minimized to the maximum extent practicable by adopting those mitigation measures and other environmental commitments that were identified as practicable;

- Alternative courses of action were evaluated and decisions were made in the best overall public interest based upon a balanced consideration: of the need to reduce wave action and coastal erosion along the shoreline in Tottenville, while enhancing ecosystems and shoreline access, use and stewardship; of the social, economic, and environmental impacts of the project; and of national, state and local environmental protection goals;
- The Proposed Actions are consistent with the applicable policies of Article 42 of the Executive Law, as implemented by 19 NYCRR 600.5 and consistent to the maximum extent practicable with the New York City approved Local Waterfront Revitalization Program (LWRP);
- The Proposed Actions, to the fullest extent possible, incorporates all environmental investigations, reviews, and consultations in a single coordinated process;
- Compliance with all applicable environmental requirements are reflected in the environmental review record required under NEPA, and as applicable, SEQRA; and
- Public involvement and a systematic interdisciplinary approach were essential parts of the development process for the Proposed Actions.

Signatories:

New York State Governor's Office of Storm Recovery

Daniel Greene
General Counsel and Certifying Officer

August 31, 2018

Date

Attachment A: Responses to Comments on the Final Environmental Impact Statement

A. INTRODUCTION

This attachment summarizes and responds to comments on the Final Environmental Impact Statement (FEIS) for the Coastal and Social Resiliency Initiatives for Tottenville Shoreline, Staten Island, NY. The cover sheet of the FEIS was signed by GOSR, acting as lead agency, on June 1, 2018. On June 13, 2018, GOSR issued the joint Notice of Availability/Notice of Completion for the FEIS through publication in the New York State Environmental Notices Bulletin and newspapers of general circulation within the affected community. A Notice of Availability was announced in the Federal Register on June 15, 2018, which established the public review period for the FEIS. Written comments on the FEIS were accepted through July 16, 2018.

New or substantive comments received on the FEIS and responses to each are provided in Section B below. Some comments have been summarized or grouped when similar views have been shared by multiple commenters, but the substance of each comment has been preserved and the summaries do not necessarily quote the comments verbatim. The name of each commenter(s) is indicated at the end of each comment. In instances where all or portions of comments were previously addressed in the FEIS, the response herein refers to Chapter 24 of the FEIS. **Attachment B** contains the list of commenters. **Attachment C** provides the comments received on the FEIS.

B. RESPONSES TO COMMENTS ON THE FEIS

PUBLIC PARTICIPATION

Comment 1: From the very start of this proposal's introduction to the residents of the Tottenville Beach area…, an outstanding aspect of its unfolding has been an utter lack of those resident's participation in the deliberative process, which, we believe, constitutes a severely invalidating weakness, running consistently through every CAC to the present.

In June of 2013, according to the EIS Final Scope of Work, HUD launched a design competition during which proposals were considered in a "year-long community based design process." Not a single resident from the above described Tottenville Beach area has seen either preliminary or final plans for the proposals that were rejected in the competition. The only official information provided at any time to any of these residents was the singular piece of information that the signed, sealed and delivered winner of the competition was the SP *[Shoreline Proposal]*.

The date, the Tottenville Beach Project evidences qualities of the antiquated "DECIDE, ANNOUNCE, DEFEND" paradigm, from the initial delivery of the already chosen proposal to the ":mitigation" approach at every objection, to the

general acceptance of the denial of any fruitful dialog, by relegating the give and take inherent in any real communication between concerned parties to a question period exercised verbally followed by written responses months later in a format couched in the protective shield of internet access, too little and too late to arouse even the most zealous of those impact by the proposals' most damaging concomitants. (Petersen_Report from Tottenville Beach)

Response: As outlined in Chapter 1 "Purpose and Need and Alternatives" of the FEIS (Pages 1-5 and 1-6), the Rebuild by Design competition was launched in June 2013 and was followed by a year-long research and design process during which the design teams met and collaborated with regional experts, government entities, elected officials, issue-based organizations, local community groups, and individuals. The goal of the program was to develop a design-led approach to proactive planning for long term resilience and climate change adaptation. In the Federal Register notice announcing the allocation of CDBG-DR funds for the project (October 16, 2014), HUD noted that "The competition process through which the proposals were developed involved transparent and inclusive community outreach and public participation surrounding each proposal," as required (79 FR 62188).

In accordance with the requirements of the Rebuild by Design competition, a number of public meetings were held to facilitate community involvement. A record of these meetings, as well as design team development meetings, is available at www.rebuildbydesign.org/news-and-events/events. A public event regarding Rebuild by Design proposals specifically for Staten Island was held on September 26, 2013, shortly after the launch of the competition, wherein members of the public were invited to provide firsthand accounts of the local challenges presented by Hurricane Sandy. An interactive planning workshop was offered to the public on February 4, 2014, in which attendees were invited to hear more about the project, engage in its design, and share their thoughts on potential futures for the south shore of Staten Island. Another public outreach meeting took place on March 11, 2014 at the Mount Loretto CYP where members of the public were invited to attend to hear more about the project, engage in its design, and see how the comments from the first event influenced the project designs and programs. The winning designs were announced in June 2014.

The Tottenville Shoreline Protection Project was conceived through the NY Rising planning process. The NY Rising Community Reconstruction Program was established by New York State to provide rebuilding and revitalization assistance to communities severely damaged by Superstorm Sandy, Hurricane Irene and Tropical Storm Lee. The planning committee held a total of eight public meeting from Oct. 2013 through January 2014 to generate and focus priority projects for inclusion in GOSR's Community Reconstruction Program which was issued in March 2014. The Shoreline Project was further developed in consultation with NYC Parks.

GOSR established a Citizens Advisory Committee (CAC) to offer additional opportunity for public input and for the State, and its design teams, to receive advice on design as the two projects progress through design and construction. There are currently 22 members on the CAC; 17 from Staten Island, 10 of which are from Tottenville. The CAC, originally established in 2015 has met 9 times. In addition, two public hearings were held as part of the environmental review process, and two public hearings were held on the Action Plan Amendments related to these projects.

Comment 2: Representation on the CAC was indicative from the very start of a bias contrary to any and all values demanded by Stakeholder Theory and the concept of a hierarchy of knowledge, with indigenous knowledge culled from local experience granted pride of place, and the rights of self-governance espoused in all the demands of modern urban planning. Somewhere around 20% of the CAC's appointed members were actually residents of our study two of eighteen actually living on property abutting the land to be altered by the project.

We believe the process underlying this project is seriously flawed in its approach assumptions, its foreground and background goal limitations and orientation, the biased narrowness of its vision, its heavily mistaken sources of evidence and its salient failure to inform and include those residents of Tottenville most effected by its impact in an early and often deliberative schema. (Petersen_Report from Tottenville Beach)

Response: Please see the response to Comment 2 in Chapter 24 of the FEIS (page 24-4) regarding CAC membership and meeting meetings through the publication of the FEIS. GOSR established a Citizens Advisory Committee (CAC) to offer additional opportunity for public input and for the State, and its design teams, to receive advice on design as the two projects progress through design and construction. There are currently 22 members on the CAC; 17 from Staten Island, 10 of which are from Tottenville. Following the publication of the FEIS, a 9th CAC meeting was held on July 18, 2018, and opportunities for community engagement (including an upcoming beach walk for community members planned for late summer 2018), will continue in the future.

In addition to CAC meetings, the public has had opportunity through the environmental review process to provide input regarding the project. The Draft Scope of Work (Draft Scope) for the Draft EIS was issued on April 1, 2015. The Notice of Intent (NOI) to prepare and Environmental Impact Statement (EIS) included notice of the public scoping session held on April 30, 2015. Oral and written comments were received during the public scoping session. Written comments were accepted from issuance of the Draft Scope through the public comment period which ended June 15, 2015. The Final Scope of Work for the DEIS was issued on April 1, 2016 and reflected modifications due to certain design advancements since the issuance of the Draft Scope of Work as well as changes made in response to relevant public comments on the Draft Scope. The

Notice of Availability and Notice of Completion for the DEIS for the Proposed Actions was issued by GOSR on March 24, 2017. GOSR held a duly noticed public hearing on the DEIS on April 26, 2017, at Public School 6, 555 Page Avenue, Staten Island, NY 10307. The comment period remained open for receiving written comments until May 8, 2017. On June 13, 2018, GOSR issued the joint Notice of Availability/Notice of Completion for the FEIS through publication in the New York State Environmental Notices Bulletin and newspapers of general circulation within the affected community. The Notice of Availability of the FEIS was announced in the Federal Register on June 15, 2018. The FEIS summarized and responded to all comments received through the DEIS public review period. The FEIS was available for public review until July 16, 2018. New or substantive comments received on the FEIS and responses to each are provided in this document.

Comment 3: We demand written responses to our question booklet you received almost two years ago before the public comment period ends on July 16 2018. At this point, with your final EIS documents in, we demand to have our questions answered in writing as promised. After many days I still cannot find the answers to our questions in your EIS and I did the most researching. (Greco_7/6/18), Greco_6/20/18)

Response: Responses to the referenced questions were provided in Chapter 24 of the FEIS ("Responses to Comments on the DEIS"). Responses to new or substantive comments received on the FEIS are provided herein.

PURPOSE AND NEED AND ALTERNATIVES

PURPOSE AND NEED

Comment 4: The grant given by HUD was for Sandy Damaged areas and repair, your projects do not repair the area's damaged or deal with the shore line issues here in Tottenville. (Greco_6/20/18)

Response: In June 2013 President Obama's Hurricane Sandy Rebuilding Task Force launched an innovative design competition, Rebuild by Design, to promote innovation by developing regionally-scalable but locally-contextual solutions that increase resilience in the northeast U.S. HUD conducted the competition under the authority of the America COMPETES Reauthorization Act of 2010, and administered the competition in partnership with philanthropic, academic, and nonprofit organizations. The competition also represented a policy innovation by committing to set aside HUD Community Development Block Grant Disaster Recovery (CDBG-DR) funding specifically to incentivize the implementation of winning projects and proposals. Ten interdisciplinary teams of scientists, engineers, designers, and architects spent months understanding the major vulnerabilities of the Sandy-affected region and developing projects to improve the region's resilience. On October 16, 2014, HUD published a notice in the

Federal Register (Vol. 79, No. 200, 62182-62194) that officially awarded $60 million of Community Development Block Grant disaster recovery (CDBG-DR) funds to the Staten Island Living Breakwaters Project as a winning proposal of the Rebuild by Design competition.

The Shoreline Project is funded under GOSR's NY Rising Community Reconstruction (NYRCR) Program. The NYRCR Program is a participatory recovery and resiliency initiative established by New York State in April 2013 to provide rebuilding and resiliency assistance to communities severely damaged by Superstorm Sandy, Hurricane Irene, and Tropical Storm Lee. Through the program, GOSR allocates CDBG-DR funds to support the planning and implementation of community-developed recovery and resiliency projects. Projects and actions implemented with CDBG-DR funding must fall into a federally-designated eligible activity category. Pursuant to Section 105(a)(2) of the Housing and Community Development Act (HCDA), the acquisition, construction, reconstruction, or installation of public works, facilities, and site or other improvements is a CDBG-DR eligible activity. Accordingly, the construction and planting of shoreline treatments, combined with the adjacent Living Breakwaters project, constitutes an improvement to existing public natural infrastructure and mitigates coastal risk in the area and, is, therefore, a CDBG-DR-eligible activity pursuant to Section 105(a)(2) of the Housing and Community Development Act.

Comment 5: Residents of Tottenville Beach have kept track of the shoreline erosion since 1967 using the distance from telephone poles at the foot of each street as measured to piles visible at low tide and have determined and tabulated that there exists a pattern of beach loss and gain each year. Some years the loss has been as great as 12 feet measured along the horizontal plane, and during others the gain has measured a high of nine feet. In fact, along the beach in question, running from Sprague Ave to Manhattan St, there was a net gain from Sandy and the total difference over the period of 48 years from 1967 to the present has been a loss of two feet. (Petersen_Report from Tottenville Beach)

Response: Please see the response to Comment 37 in Chapter 24 of the FEIS (page 24-25).

Comment 6: This project will not prevent flooding every time there is a heavy rain the street fills up with water and it comes up my driveway and into my home. (Crispi_6/27/18)

Response: Please see the responses to Comments 16, 68, 148 and 150 in Chapter 24 of the FEIS (pages 24-13, 24-45, 24-83 and 24-84, respectively). It should be noted that further studies are being coordinated with NYCDEP for subsequent phases of the design of the Shoreline Project.

Comment 7: Nowhere in the EIS Draft Proposal is there a shred of evidence that the measures proposed will lessen inundation. (Petersen_Report from Tottenville Beach)

The breakwaters will do nothing to prevent a Sandy type tidal surge. (Greco_6/20/18).

On at least two occasions in the course of CAC meetings, the question was raised by residents concerning the design's ability to prevent flooding. The reply to the first was the handy magical application of the Mitigation" miracle, but the second remarkably evinced the candor of an admission that the elimination of flooding was neither the purpose of the berm nor one of its anticipated effects. (Petersen_Report from Tottenville Beach)

Response: As described in Draft and Final Scope of Work (March 2015 and March 2016, respectively, and Chapter 1, "Purpose and Need and Alternatives" of the DEIS and FEIS (March 2017 and June 2018, respectively), the purpose of the Proposed Actions is to reduce wave action and coastal erosion along the shoreline in Tottenville, while enhancing ecosystems and shoreline access, use and stewardship. The Breakwaters Project has been designed to meet all aspects of the project's purpose and need. The ability to meet this purpose is measured in terms of risk reduction, ecological enhancement and social resiliency goals and objectives. The risk reduction goals and objectives include attenuation of wave energy, address event-based and long-term shoreline erosion, and address the impacts of coastal flooding. The Shoreline Project has been designed to reduce risk for the shoreline area of Tottenville from wave action, and to address future shoreline erosion. As described in the response to Comment 150 in Chapter 24 of the FEIS, the Shoreline Project would allow water to seep through, either from the upland side to the Raritan Bay side, or from the Raritan Bay side to the upland side; the project is not intended to prevent Raritan Bay storm surge from entering the land, nor would it retain water inland.

Comment 8: This project will do nothing for storm protection. This is the calmest bay with no waves. (Halvorsen_6/24/18, Greco_7/4/2018)

Response: Please see the response to Comment 35 in Chapter 24 of the FEIS (pages 24-24).

Comment 9: You need to spend the money west of Sprague Avenue where lives and homes were lost this area is 8 to 16 foot lower they need all the help. (Halvorsen_6/23/18)

Response: Please see the response to Comment 3 in Chapter 24 of the FEIS (page 24-5).

DESIGN METHODOLOGY

Comment 10: The very concept of planning based on weather patterns predicted decades in advance is highly questionable. Waves in Raritan Bay are 99% wind generated Wind patterns are part and parcel of weather patterns. Weather prediction is unreliable more than ten days in advance.

The wave velocity, period and direction was monitored in one location for maybe two years. The area in question has countless eddies, both forward and reverse, which affect shore impact differently in as many different locations as there will

be reefs, since wind generated waves' quality depends as well on current direct, changing constantly throughout the tidal and lunar cycle. The rotational vortices have also managed to traditionally elude linear detection and prognostication methods. (Petersen_Report from Tottenville Beach)

Response: The wave analysis for the Breakwaters Project was based on 30 years of available offshore wave hindcast data from the United States Army Corps of Engineers (USACE), coupled with 30 years of local wind data, and 30 years of tide data from the Sandy Hook tide gage. As described in Chapter 1, "Purpose and Need and Alternatives," nearshore wave conditions were established by transforming wave conditions from the offshore to the nearshore using the Simulating Waves Nearshore (SWAN) wave transformation model. A baseline wave climate of Raritan Bay was developed to determine historic wave conditions and as input to modeling used to predict breakwater impacts on wave climate and long term shoreline change. The long-term wave climate was developed by transforming wave hindcast data from a USACE Wave Information Study station at the entrance of New York Harbor. The modeling effort was validated through the use of locally measured wave data. The analytical methods utilized to evaluate breakwater performance are industry standard methods, utilizing the best available data. The analysis looked at waves and currents in the project area. The analyses completed incorporate the major coastal processes which drive beach change and wave attenuation and provide a reasonable evaluation of future performance. Chapter 1, Purpose and Need and Alternatives of the FEIS, and response to Comment 35 of Chapter 24 (page 24-24) of the FEIS discuss the methods utilized to evaluate coastal processes.

Comment 11: Another side effect could be a strong under tow by the water rushing between the break water structures causing what is known as a Sea Puss. Seas Puss definition: a strong near shore current resulting from a seaward flow of water through a channel in the bar [breakwater]. The breakwater near Tottenville is near a shipping channel and deep water, so the openings in the breakwater could increase the under tow. One solution could be to angle the breakwater to the beach thus increasing the size of the opening. (Hartigan_7/16/18)

Response: The design process considered the potential to affect under tow and other potential effects on currents. To minimize potential issues, the design included as large a gap as possible between the breakwater segments while still providing the wave and shoreline erosion reductions per the project's purpose and need. As described in Chapter 1, "Purpose and Need and Alternatives," of the FEIS, DELFT3D numerical model was used to evaluate flows between the breakwater segments. The results of this modeling has shown no significant increase in currents through the gaps over the "no action" alternative. Additional computational fluid dynamic (CFD) modeling (FLOW3D) was also utilized to inform the breakwater design to minimize scour and flow velocity around the ends of the breakwaters.

Comment 12: Wave tank tests have no actual reality to the complex hydrology of the Raritan Bay, it's ecosystem, it's currents, ebb tides, weather, shipping, pleasure boating and activity. (Greco_6/19/18, Greco_6/20/18)

Response: Regarding the utility of physical modeling, the USACE Coastal Engineering Manual (EM 1110-2-1100, 20011) states: "Major structures should always be tested with a physical model." However, the physical wave modeling was just one component of a suite of tools used to evaluate how the breakwaters would interact with the hydrodynamics of the site and bay. GOSR and the team acknowledge the complexity of the hydrodynamics of the bay, which is why such extensive modeling, using multiple types of models, and analysis has been undertaken See Section E (page 1-9) of Chapter 1, "Purpose and Need and Alternatives" of the FEIS regarding the design methodology and modeling performed for the proposed projects.

PROJECT ALTERNATIVES

Comment 13: Principal weaknesses of layered approach include dependency of total plan on effectiveness of each individually. In the event any of the anticipated benefits either does not perform to its maximum designed efficiency, or even performs minimally, the total expectations of the system suffer. In the event one layer fails entirely, as a weakest link, the entire proposal loses its rationale. For example, in the event that the in water breakwaters do not completely eliminate shoreline erosion and that the permanent dune is placed upland of the present temporary dune, the valuable Parks' property will, in time, run the risk of being lost to erosion, which would not have been the case had the permanent dune been placed in the location of the temporary, and engineered to protect against erosion, as are the many shoreline barriers and groin systems that have proven their worth over many decades both along NJ ocean beaches, the beaches running Eastward along the NY Long island barrier islands, and the Tottenville shoreline itself. If the breakwaters fail to prevent erosion with the dune placed upland of the high tide line, the beach could be lost. If the dune fails to even come into play due to its location, its negative impacts are for naught.

Until the many other potential alternative possibilities for protection are more fully explored, and a better balance struck between the negative impacts and anticipated benefits, we will continue to refuse to forego the really important questions of this proposal. (Petersen_Report from Tottenville Beach)

Response: Each of the projects independently provide significant coastal risk reduction, ecosystem services, and social resilience (public access, education, stewardship) benefits.

The breakwaters are being designed to reduce or reverse beach erosion. Coastal processes of sediment transport would be altered but not halted or eliminated. The breakwaters would also reduce infrequent storm wave heights, which contribute to erosion of coastal dunes, banks, and bluffs. The Shoreline Project is being

designed to reduce risk from wave action. It would also reduce erosion of coastal dunes, banks, and bluffs. When combined in a layered approach, the sum of these benefits would be greater than their parts, but each project is designed to function independently, as well as in tandem. If one component were to fail, which is not anticipated, this would not result in the failure or loss of function of the other project.

The FEIS analyzes three alternatives including the combined projects (Alternative 2), the Breakwaters Project without the Shoreline Project (Alternative 3) and the Shoreline Project without the Breakwaters Project (Alternative 4). The environmental impacts for each of these alternatives are analyzed and compared for each of the technical analysis categories.

In addition to the analyzed alternatives, Chapter 1, "Purpose and Need and Alternatives" presents other alternative coastal strategies that were considered but eliminated from further consideration. These included, beach nourishment/renourishment, groins, constructed/restored wetlands, sills, constructed reefs/subtidal breakwaters, floating wave attenuators, bay nourishment/shallowing, levees, and seawalls/bulkheads. These alternatives were not identified as practicable resilience strategies for this area of Staten Island and therefore were not considered further.

Comment 14: Extend the outfall drains to create natural rock jetties and pump sand in between them and move this type of project to another area where it can be far more effective (Panarello_6/24/18)

The sand needs to be replenished on a shoreline. Every foot of sand will give you 15 ft of a Beach which will give us protection make the beaches beautiful so everyone can enjoy them. (Halvorsen_6/24/18)

The protection we need is for the storm water outfalls to be extended and made into groin jetties also replenish the sand between the jetties. This will give us protection and we will now have a beach once the sand is replenished. The outfalls is causing the beach erosion which is taking away our protection. (Halvorsen_6/24/18, Halvorsen_6/23/2018, Greco_7/4/2018)

Response: Please see the responses to Comments 8, 14, 15, 16, and 37 in Chapter 24 of the FEIS (pages 24-8, 24-10, 24-12, 24-13, and 24-25, respectively).

The People's Plan

Comment 15: Remove all the derelict spiked pilings, docks, piers, structures, concrete, boulders, construction debris, old infrastructure, and garbage, on the beach and in the shallows. All these things are an extreme hazard to walkers, hikers, runners, swimmers, fishermen, kayakers, water skiers, jet skiers, boaters, wildlife and marine life. As well as anything else that may take place on the beach or in the water. (Greco_7/11/18, Greco_7/16/18 The People's Plan)

Response: Please see the responses to Comments 80 and 81 in Chapter 24 of the FEIS (pages 24-53 and 24-54, respectively).

The pathway being proposed in the Shoreline Project would provide a safe accessible route for walkers, hikers, and runners, and ADA access points, pathways, and overlooks along the length of the shoreline project (where there was none prior to the project). It would facilitate the maintenance and garbage removal done by NYC Parks. Swimming is not permitted in Conference House Park.

The Breakwaters Project and Shoreline Project would not preclude any future removal of old infrastructure and debris by NYC Parks or New York State Department of Environmental Conservation.

Comment 16: Re-purpose all the natural rocks and boulders for: 1) Shore Line Rip Rap – will protect the area from storm surges and erosion, 2) Short Groin Jetties – with reflective poles at the ends, this will prevent beach erosion), and 3) Natural Reefs – can be put in a number of places along the shore line where there are higher bluffs with no homes, no views obstructed, and not in busy commercial or recreational use areas, this will also create a natural marine habitat for oysters and many other ecosystems and marine life. Also alleviates commercial maritime proximity and our number one concern a environmental disaster from an oil tanker or barge hull breech. Stone sizes, placement, amounts, and location, to be determined by my marine engineer, with input by locals that know the lay of the land. (Greco_7/11/18, Greco_7/16/18 The People's Plan)

Response: Please see the responses to Comments 15, and 41 in Chapter 24 of the FEIS (pages 24-12, and 24-31, respectively) and the following response.

<u>Shoreline Riprap</u>

Riprap or riprap like construction is proposed for some segments of the shoreline as part of the Shoreline Project including the eco-revetment and raised pathway. However, riprap is not appropriate in all segments of the shoreline. Other segments would be constructed from materials including stone and riprap but which must be combined with other materials to be more stable, resilient, and durable.

The projects will require stone and other materials beyond what is available on site. Rocks and boulders do not exist in sufficient quantity on site to create barriers that would protect the area from storm surges and erosion.

<u>Short Groin Jetties</u>

Chapter 1, "Purpose and Need and Alternatives," provides a discussion of alternative coastal strategies considered for the Breakwaters Project, including groins, and why these alternative strategies were not considered for further evaluation. Groins are generally shore perpendicular rock or sheet pile structures

designed to trap and retain sediment from longshore transport. Groins interrupt the longshore sediment transport accumulating sediment on the updrift side and depriving sediment to the downdrift side resulting in a pattern of accretion and erosion adjacent to the structure. This effect can be partly mitigated by prefilling the groin with sediment allowing more sediment to bypass the end of the structure. As presented in Chapter 1, groins would not meet the risk reduction goals of attenuating wave energy before it reaches the shore. While groins would address shoreline erosion, this would occur by blocking longshore transport, increasing the potential for erosion elsewhere along the shoreline. Groins would not meet the risk reduction goal of addressing impacts of coastal flooding, the ecological enhancement goal of increasing diversity of aquatic habitats within Raritan Bay, or the social resiliency goals and objectives of the Proposed Actions. For all of these reasons, groins were not considered practicable and were not evaluated further.

Natural Reefs

Chapter 1, "Purpose and Need and Alternatives," provides a discussion of alternative coastal strategies considered for the Breakwaters Project, including constructed reefs or subtidal breakwaters, and why these alternative strategies were not considered for further evaluation. As discussed in Chapter 1, as these types of systems are intended to remain submerged, they do not provide significant storm wave attenuation, especially during elevated water levels, nor would they provide the erosion protection risk reduction goal and objective of the Proposed Actions. Constructed reefs or subtidal breakwaters would not meet the social resiliency goals of the Proposed Actions. Submerged structures such as these within the shallow water habitat of this portion of Raritan Bay would also have the potential to affect navigation safety. For all of these reasons, constructed reefs or subtidal breakwaters were not considered practicable and were not evaluated further.

Comment 17: Storm line infrastructure is to be repaired, especially where flooding occurs during heavy rain. Install pump stations where necessary in lower elevations. Outfalls transitioned, extended, check valved, secured and buried. (*4 This will also help prevent erosion and prevent flooding. (Greco_7/11/18, Greco_7/16/18 The People's Plan)

Response: Please see the responses to Comments 15, 148 and 150 in Chapter 24 of the FEIS (pages 24-12, 24-84 and 24-85, respectively), and the following response.

The Proposed Actions would not preclude such efforts; however they are outside the scope of the current project. The purpose and need of the Breakwaters and Shoreline Projects are targeted at coastal risks. However, as part of the research being done for the final design of the Shoreline Project, GOSR is undertaking, in coordination with DEP, a study of the functioning of the outfalls in the area. The information obtained would ensure that the proposed resiliency measures do not

further tax the area's drainage system and may provide information useful to enhance the current system. Coordination with DEP regarding regular maintenance of the system to avoid flooding during storm events is ongoing.

Comment 18: Beach is to be raised and extended, elevation and length to be determined by marine engineer with input from locals that know the lay of the land. We are looking for 4 foot elevation and 60 of beach added. This will provide a means of egress along the shore line for as long as the beach is continued for public use thus removing the controversial and dangerous public pathway mere feet from homeowners bedroom windows also for park maintenance the use of gators, not heavy trucks that have environmental, ecosystem and quality of life issues). (Greco_7/11/18, Greco_7/16/18 The People's Plan)

Response: Please see the responses to Comment 8 in Chapter 24 of the FEIS (page 24-8) and the following response.

Chapter 1, "Purpose and Need and Alternatives," provides a discussion of alternative coastal strategies considered for the Breakwaters Project, including beach nourishment, and why these alternative strategies were not considered for further evaluation. As discussed in Chapter 1, beach nourishment is the (periodic) placement of sand on and adjacent to an existing beach into shallow waters along the shoreline to extend the shoreline and widen the beach, resulting in a beach berm. A wider beach can increase and enhance waterfront public open space and reduce the risk of upland infrastructure to ongoing erosion by providing sacrificial beach width. The beach can also provide some wave attenuation benefits for smaller, more frequent storm events as long as storm surge elevations are not significantly higher than the beach. While beach nourishment of sufficient size, if maintained (regularly re-nourished), can provide some wave attenuation and act as sacrificial erosion protection to the land behind, given the high surge elevations experienced on the south shore of Staten Island, a beach berm alone would provide little storm wave reduction benefit, and thus beach nourishment alone would not fulfill the project purpose and need. At the project site, beach nourishment is not sustainable without additional protective and stabilizing features (such as breakwaters) and would need to be regularly maintained (re-nourished) over time, resulting in periodic disturbance to beach users, wildlife and fish and benthic invertebrates during each of these sand placement events, rather than a one-time construction event. Beach nourishment/re-nourishment would not meet the risk reduction goal of addressing impacts of coastal flooding, nor the ecological enhancement goal of increasing diversity of aquatic habitats within Raritan Bay, or the social resiliency goals and objectives of the Proposed Actions. For all of these reasons, beach nourishment alone was not considered practicable and was not evaluated further.

Comment 19: Conservancy – Wooded areas are to be cleaned up of the mass amounts of dead forestry from salt water flooding and storm damage. It is a fire hazard to have that

much dead dried out twigs, branches, and trucks. Also remove anything unnatural, derelict structure or buildings, infrastructure, refuse, debris and garbage. This will provide a healthy, clean, and safe habitat for all living creatures. (Greco_7/11/18, Greco_7/16/18 The People's Plan)

Response: NYC Parks maintains the natural areas of Conference House Park in accordance with management strategies developed for these ecological communities.

Comment 20: Remove what NYC Parks considers evasive species without chemicals of any sort, no more Round Up, Accord, or cancer causing glyphosate. It has been sprayed in the parks for the past 15 years that I know of, and has leached into the beach and Raritan Bay. Goats, tools, machines, or manual labor only. (Greco_6/20/18, Greco_7/10/2018, Greco_7/11/18, Greco_7/16/18 The People's Plan)

Response: Phragmites removal methods are being evaluated as part of permitting for the project. Methods for the removal of invasive species will be planned and closely coordinated with both NYC Parks Natural Resource Group (NRG) and NYSDEC, and would adhere to all New York State environmental laws and guidelines.

Comment 21: Habitat areas for insects, animals, birds and marine life are to be preserved. (Greco_7/11/18, Greco_7/16/18 The People's Plan)

Response: Please see the response to Comment 106 in Chapter 24 of the FEIS (page 24-64). Also, as described in Chapter 9, "Natural Resources" of the FEIS (page 9-3), the enhancement of the 0.8-acre delineated tidal wetland would benefit wetland resources and wildlife that would use this wetland.

Comment 22: Reduce water pollution from any source it is derived from. Educate and help with grants if necessary for people that conduct business on the water that may have to make changes to their business to stop water pollution. (Greco_7/11/18, Greco_7/16/18 The People's Plan)

Response: As presented in Chapter 9, "Natural Resources" of the FEIS, the Breakwaters Project has been designed to maintain sufficient flushing conditions in the study area to minimize potential changes to water quality. The results of the hydrodynamic modeling (using DELFT 3D) project negligible changes in tidal flushing would result from the breakwater alignment. Changes in residence times (time water remains in the area shoreward of the breakwater segments) were modeled as less than a few hours, consistent with tidal exchange. Thus, modeling confirmed that the Breakwaters Project would have negligible, if any, impact on water circulation and flushing and thus water quality within the study area. Although reducing water pollution from other sources is outside the scope of this project, education is an integral part of it. Through educational programming, the project proposes to raise awareness of ecosystem benefits and hazards and establish a stronger constituency of stewards of the shoreline and harbor.

Any interested parties should feel free to pursue education that is specific to reducing water pollution. It is not precluded by the project.

Comment 23: Water Hub relocated from the original position next to residential homes to a more convenient and use full area. The end of your proposed 7 mile board walk that would put it at the end on Oak beach just outside the Great Kills Marina. This location would get 1000 times the use and productivity compared to the nestled hidden location with very few people attending. (Greco_7/11/18, Greco_7/16/18 The People's Plan)

Response: As described in this Joint ROD and Findings Statement, Potential Location 3 for the Water Hub (a vessel, or "floating" Water Hub) has been selected for implementation as part of the Proposed Actions. As described in the FEIS, the vessel would visit the breakwater project area for education and monitoring and would be docked at existing facilities in the City.

BREAKWATERS PROJECT

Comment 24: Although it's admitted by the people behind this project that it cannot and will not protect us from a super storm for a tidal surge, the obstacles that they want to put in this water way which is a bay not an ocean will create tremendous amounts of navigation hurdles for fall water crafts let alone an oil tanker or ships carrying hazardous materials. Accident or spill of one of those ships which is for more likely than any super storm that this project already claims it cannot save from will be devastating to this area and its ecosystem and way of life for years to come.

Putting obstacles in a narrow bay that tends to have very little in the way of waves will create a more difficult water path for crafts to navigate ending to a major concern of accidents by old boat craft especially any tanker containing harsh chemicals and or oil. Any catastrophe like that will equal decades of problems, and ironically that kind of accident is far greater likely than the proposed hazard of a super storm that this project claims it is trying to prevent however it was documented by the people the familiar with this project that storm surges can not be protected against. (Panarello_6/24/18)

City sized islands in the narrowest busiest part in the middle of the Raritan that leads into 110 degree turn up the Authur Kill could be a hazard with marine traffic carrying millions of gallons of fuel and oil. (Greco_6/20/18)

The installation of the breakwaters will be disastrous for oil tankers and personal watercraft. This is a very narrow channel where we witness ourselves two ships run aground on the shore. This can cause a Exxon Valdez which would take years to clean, never mind the animals and plant life which will be effected. (Halvorsen_6/24/18)

An oil laden tanker transiting Wards Point Bend has a minimum of 12-15' draft, in the example of the "lighters" that shuttle their cargo from the larger vessels, to 15-30' draft for the larger vessels. In light of the two actual groundings of such

vessels that actually took place in the area under study within a single decade beginning about 40 years ago, the issue of whether such a grounding in the shallow flats within which the proposed Breakwaters will be located becomes academic, yet worth relating for those still skeptical.

It would be difficult to design a more unfriendly environment for the safe passage of small craft, which abound in the area of Wards Point Bend under study, and whose operators tend to be among the least experienced.

As for access for children from the local schools as an educational adjunct to the "Hub", few school administrators would advise or authorize a program that involved small boats at all, and certainly not to a region so strewn with hazards as a reef system.

Of larger vessels, whose passengers like those of smaller craft, would certainly be endangered as well, by those hazards, wholly unnecessary in light of the all too obvious availability of alternate means of dealing with beach erosion employed successfully and at much less cost for years to replenish the beaches elsewhere?

Most local boaters do not carry either paper or electronic charts and warning lights of any sort are compromised in this area by the proliferation of shorebound lighting, wherein it becomes extremely difficult to distinguish close up lights from distant ones.

Under this proposal, anything North of the channel would be a "Noman's land", and a potential nautical graveyard to those unfortunate enough to be uninformed, or fog enshrouded, no matter how buoyed, marked or lit. (Petersen_Report from Tottenville Beach)

Response: Please see the responses to Comment 41 in Chapter 24 of the FEIS (page 24-31).

Comment 25: As for water skiing, swimming, canoeing or kayaking, anyone unfortunate enough to have their bare feet touch bottom among the reefs would soon learn that the surface of an oysterbed is as sharp as razors, and reefs in any form are the enemies of watercraft and their passengers. (Petersen_Report from Tottenville Beach)

Response: Swimming is prohibited in Conference House Park. As described in the response to Comment 41 in Chapter 24 of the FEIS (page 24-31), it is anticipated that the U.S. Coast Guard would require navigation aids and NOAA would update the navigation chart for Raritan Bay to reflect the presence of the breakwaters. These measures would help recreational shallow draft vessels (such as those associated with water skiing, canoeing, or kayaking) to navigate the Bay around the breakwaters.

Comment 26: I would also be concerned as to eight 365 days a year flashing 360° lights in the water that will shine constantly to peoples windows. (Panarello_6/24/18)

Regarding navigation aids, how many lights, what would be the power source, what would be the output in Lux or luminous emittance, what would be the total Lumens of all lights, the range of illumination, spread of illumination, and elevation of mounts? (Greco_6/20/18, Greco_7/10, 2018)

Response: Please see the response to Comment 41 in Chapter 24 of the FEIS (page 24-31), and the response to Comment 28 in Appendix K of the FEIS (page 11).

Comment 27: There are five Island-based yacht clubs and a dozen or more from N.J. that consider the area within the proposal their own. Indeed, were the Breakwaters plan to be adopted and constructed, more than 20% of the waters available to smallcraft at the western end of the Raritan Bay would effectively become off limits. (Petersen_Report from Tottenville Beach)

Response: The waters of Raritan Bay are not privately owned. As described in Chapter 9 "Natural Resources," the Raritan Bay-Sandy Hook Bay complex comprises approximately 33,500 acres of open waters. The proposed project considered a study area of 610 acres, consisting of the open waters of Raritan Bay bounded to the north by the shoreline of Staten Island and to the south by the navigation channel. The breakwaters would occupy 11.4 acres of the bay bottom, which represents approximately 2 percent of this 610-acre study area and 0.03 percent of the Raritan Bay-Sandy Hook Bay complex on a whole. The remaining 98 percent of the study area, and 99.97 percent of the complex, would continue to be available to smallcraft in Raritan Bay.

Comment 28: I myself may not purchase the home of my dreams any more after seeing how the beautiful natural setting of this area will be filled with polypropylene and concrete which will further complicate things with negative results. (Greco_6/20/18)

Response: Please see the response to Comment 40 in Chapter 24 of the FEIS (page 24-28).

Comment 29: A water hub at the end of Page Avenue will generate much congestion and again invasion of privacy and our way of life over here not to mention bringing down the value and the look to our neighborhood. It's logical place should be by the conference house (Panarello_6/24/18)

Response: As described in this Joint ROD and Findings Statement, Potential Location 3 for the Water Hub (a vessel, or "floating" Water Hub) has been selected for implementation as part of the Proposed Actions. As described in the FEIS, the vessel would visit the breakwater project area for education and monitoring and would be docked at existing facilities in the City.

Comment 30: Are you planning on having docks on these islands and finger reefs? (Greco_7/6/18)

Response: No seasonal or permanent docks are proposed as part of the project. With this Joint ROD and Findings Statement, Potential Location 3 for the Water Hub (a

vessel, or "floating" Water Hub) has been selected for implementation as part of the Proposed Actions. As described in the FEIS, the vessel would be docked at existing facilities in the City. No docks at the project site would be required because education and monitoring activities could occur directly from the vessel.

Comment 31: We have oysters in their proper proportions in the marine world. (Greco_6/20/18, Greco_7/4/2018)

Response: Please see the response to Comment 13 in Chapter 24 of the FEIS (page 24-10).

SHORELINE PROJECT

Comment 32: Number one the pathway creates hazard for the homeowners here being the lack of privacy, and easier access to private property for vandalism and theft. (Panarello_6/24/18)

I live right on Joline lane and am concerned greatly for a pathway that will basically one in the backyard's of my neighbors and I which will cause privacy concerns as well as the possibility for vandalism and theft due to be easier access of people onto our properties. (Panarello_6/24/218)

A public pathway next to my home will affect my safety and the safety of this community. (Crispi_6/27/18)

The pathway will only bring violent crime to the back doors of my friends and neighbors. (Greco_6/20/18)

All the homeowners east of Sprague Avenue to Page Avenue are totally against the millions that you're trying to waste on a pathway which is going to run right through the homeowners backyards. This pathway has nothing to do at all with storm protection it's only going to destroy the neighborhood. This pathway will only take away the quality of life and safety and be an invasion of privacy with no buffer zone. (Halvorsen 6/23/18, Halvorsen_6/24/18, Halvorsen_6/30/18)

The pathway should not be installed behind hard working tax payers homes that are already on high elevation. We don't need an open pathway behind our homes 24 hours a day/7 days a week unpoliced. This is a very serious quality of life issue. We have young children, elderly and pets that we need to protect and don't strangers in our back yards. Nobody would want a pathway in their back yard only a few feet from their windows. (Halvorsen_6/24/18)

What of the increased likelihood of greater threats to life and property of all beach goers due to the provision by the plan for an ideal location for criminals, intending harm to all residents, from which to plan and launch their forays into properties, public and private, immediately abutting the cover provided by the elevated/berm/walkway? (Petersen_Report from Tottenville Beach)

Response: Please see the response to Comment 76 in Chapter 24 of the FEIS (page 24-52).

Comment 33: Thank you for the continued updates regarding this project. As a resident of the town of Tottenville, I have noticed that the sand dunes (Sprague St and points south) have experienced substantial erosion over the past few years. There has been no attempt to correct/replenish the diminishing sand. Shouldn't this be considered part of this project in effort to prevent similar problems to Sandy? (Giordano_6/13/18)

Response: As described on page 1-19 in Chapter 1, Purpose and Need and Alternatives" of the FEIS, the temporary dune system that stretches from approximately Swinnerton Street to Sprague Avenue would be removed and replaced with the Shoreline Project elements proposed for this stretch of the shoreline (i.e., an earthen berm, a hybrid dune/revetment system, two sections of eco-revetments, a raised edge (revetment with trail), wetland enhancement, and shoreline plantings.

Comment 34: Porous concrete must be maintained, preferably quarterly, by application of solvent where required and vacuuming or power washing, or risk becoming ineffective in its permeability, particularly in areas where there might be a concentration of particulate matter that might clog its pores, viz-the beach. The other type of berm that has enjoyed greater freedom from inadequacy involves using materials much larger in such a way that passages are created that would not be clogged, such as large, irregularly shaped stone, with openings even larger, such that a person could pass through, allowing rapid passage of water to provide adequate drainage and make drownings less likely. (Petersen_Report from Tottenville Beach)

Response: Porous concrete is not proposed for use in any of the Shoreline Project elements. The Shoreline Project would consist primarily of the placement of bedding stone, armor stone, and revetment stone to construct the various Shoreline Project structures with some concrete elements incorporated for the eco-revetment and raised edge. Sand placement and final grading and planting would be done following stone placement. As described in Chapter 11, "Sewer and Water Infrastructure" of the FEIS, these elements would allow water to seep through, either from the upland side to the Raritan Bay side, or from the Raritan Bay side to the upland side; the project is not intended to prevent Raritan Bay storm surge from entering the land, nor would it retain water inland. Please see the response to Comment 23 in Chapter 24 of the FEIS (page 24-17) regarding the maintenance required for each proposed design feature.

Comment 35: Rather than augment shoreline access the plan would likely diminish access both from land and sea for most and entirely rule out access for the many less foolhardy.

In the situation under consideration of the Tottenville Project, the greatest public access had been provided prior to the placement of the temporary berm, which access would be further diminished if the new, permanent and higher berm should replace the existing, lower, temporary one.

Since there were, as long as anyone can remember, nine streets running perpendicular to the waterfront between Hylan Blvd. and the beach, and at least four of these access points have already been eliminated by the temporary berm, followed by three more going the way of the first four, would the Shoreline Project be undertaken as is, the plan itself would reduce nine access points to two, 1600' apart compared to the original 200' apart. Not only would the seven street's access points be drastically and unreasonably eliminated under the Shoreline Project, but the access points formerly running along and parallel to the beach contiguous to private property would suffer the same fate. So the total reduction in shoreline accessibility under the Shoreline Project's Proposal would amount to the loss of a full 1600' of precious footage, from 1700' to 100'.

Prior to installation of the temporary berm, there were six streets running from Brighton St on the West to Sprague Ave on the East, that provided direct access for all Tottenville residents to the waterfront. Under the current proposal, every one of these access points will be impeded by a permanent, stone-cored dune which, in order to provide the protection that the plan calls for from an anticipated 100-500 year storm, will loom 16’ plus above Mean High Water (MHW). This height would place this obstruction at least five feet above the current temporary berm, and at least eleven feet above the average final elevation of the waterfront streets extant. (The 16’ figure comes from this same EIS draft, as the height that Sandy surged to in Tottenville). Since the report states that the plan must take into account global warming/rising sea levels and it refers to 100-500 year storms, the “plus” that modifies the 16’ would, we might suspect, be rather substantial

Even in the unlikely event that climbing this 10’ + high monstrosity might be permitted, few would attempt it – certainly not the elderly or the handicapped – and even fewer would allow their children to play on the beach which would be located on its Bayside, hidden from any possible parental supervision by this same obstruction. (Petersen_Report from Tottenville Beach)

Response: Consistent with the purpose and need of the Proposed Actions to increase physical and visual access to the water’s edge, existing access from land within Conference House Park and street ends would not be eliminated, and access to Conference House Park from the water would not change as a result of the project. Instead, access to the shore from land, including street ends, would be enhanced through the addition of ADA access points, pathways, and overlooks along the length of the shoreline project (where there was none prior to the project). Additionally, the continuous pathway would accommodate pedestrian visitors and bikers with varying mobility challenges. As indicated in Chapter 2, “Land Use, Zoning and Public Policy” of the FEIS, running along and adjacent to these elements, the project would provide an interconnected, seamless, and ADA accessible waterfront trail along the shoreline, connecting the Shoreline Project elements to the existing Conference House Park trail system. The hybrid dune/revetment, which would replace the existing temporary dune system, would provide access

to the beach where there currently is none. The connected trail system through upland open spaces along the shoreline would is being designed to include multiple levels of access to the waterfront (i.e., continuous trail, earthen berm, beach access over dune/revetment, stairs leading to sidewalk, etc.), and native landscaping throughout would enhance connectivity to the existing scenery. The design of these elements is not complete, but all of the above solutions are being considered thoroughly as the design progresses. Please also see the response below regarding the planned elevations of the various Shoreline Project components.

Comment 36: The existence of a solid barrier erected between the residents' homes and the beachfront deprives the nearby residents of the greater share of their ability to monitor potential criminal activity along the stretch of beach from Page Avenue through Brighton St, which has been on the rise.

We have witnessed innumerable marine incidents of small and large vessels and their crews in distress, both in the water's depths and along its shores, whose happy outcomes owed a great deal to the vigilance and rapid reporting of their exact location and disposition, none of which could now be the case due to the current temporary berm and its taller permanent replacement, which no amount of increased patrolling by the NYPD could remedy, nor any type of surveillance replace. Most of these potential tragedies would not have been preventable without direct visual confirmation of their location and need.

How, we may very well ask ourselves, does the security wrought by having the eyes of those residents most concerned and impacted, on the great variety of criminal activity that threaten beach goers themselves, outlined at the recent NYPD NCO meeting, how does that security weigh against the choice of beach replenishment by traditional methods rather than the fool's errand that would block any and all eyes from beach surveillance day and night? (Petersen_Report from Tottenville Beach)

Response: The proposed project components between Brighton Street and Page Avenue include: the hybrid dune/revetment system, the two eco-revetments, and the raised edge. The eco-revetment (between Manhattan and Brighton Street) is currently planned at elevation +12.5 feet NAVD88, a similar elevation as the existing temporary dune. The proposed hybrid dune/revetment (between Manhattan and Loretto Streets) is currently planned at elevation +14 feet, which is about 1.5 feet higher than the elevation of the existing temporary dune (elevation +12.5 feet NAVD88) that it would replace. The rock core within the hybrid dune/revetment would extend to a similar elevation as the temporary dune. The eco-revetment between Loretto Street and Sprague Avenue would be a similar height as the existing temporary dune at approximately 4 feet above the existing street grade. The raised edge is planned at approximately +8 feet NAVD88, which is similar to the elevation of upland areas adjacent to this feature. The raised edge would extend between 1 and 4 feet above the existing beach grade. As described in

Chapter 6 "Urban Design and Visual Resources" of the FEIS, the views of residents, pedestrians, motorists, bicyclists, boaters, and users of Conference House Park would be minimally affected by the components of the project. The hybrid dune/revetment, while 1.5 feet higher than the existing temporary dune system which it would replace, would provide a more gradual transition from upland elements to the shoreline. It would not be significantly different compared to the existing view of the beach with the temporary dune, as illustrated in Figure 6-11. The visual access to the water and any incidents that may occur on the water will not be significantly altered from its current state.

Please also see response to Comment 76 in Chapter 24 of the FEIS (page 24-52).

SOCIOECONOMICS

Comment 37: This project will lower the value of houses in this entire area not to mention put a drain on the municipality to upkeep everything which they already don't keep anything now. (Panarello_6/24/18)

Response: It was concluded in FEIS Chapter 3 "Socioeconomic Conditions" that: "The alternative's wave attenuation and social resiliency measures could lead to an increase in residential property values over time due to the following influences: 1) the project's improved open spaces and amenities could make the area more desirable as a residential neighborhood; and 2) the reduced risk of property damage from wave action and erosion could increase the desirability of the neighborhood, and could reduce costs associated with investing in resiliency measures at individual properties." There is no evidence that the proposed project would lower the value residential property in the study area.

As described in the response to Comments 23 and 24 in Chapter 24 of the FEIS (pages 24-17 through 24-20), GOSR will develop maintenance and operation plans for the project components in collaboration with state, city, and federal agencies, as well as non-profit organizations. NYC Parks would own and manage the Shoreline Project components, NYSDEC would own and maintain the breakwater structures, and a non-profit organization would operate and maintain the floating Water Hub.

HISTORIC AND CULTURAL RESOURCES

Comment 38: Thank you for continuing to consult the New York State Historic Preservation Office (SHPO). We have reviewed the provided documentation in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources. We have reviewed the scope of work and supporting documents submitted to our office to date. Based upon our review, SHPO continues to recommend a Phase 1B archaeological investigation of certain portions of the APE, as described in the Phase 1A report. (SHPO_6/20/18)

Response: Comment noted.

Comment 39: The LPC is in receipt of the final EIS dated June 2018. The text for architectural and archaeological resources appears acceptable. (LPC_6/12/18)

Response: Comment noted.

HAZARDOUS MATERIALS

Comment 40: Please provide the MSDS for any and all products, chemicals, building materials planned for these projects. Please start with the MSDS for the concrete from Israel AKA Armored Toe Units, and the Polypropylene AKA Geo textile and all others promptly. (Greco_6/21/18)

Response: The Hazard Communication Standard (HCS) (29 CFR 1910.1200(g)), revised in 2012, requires that the chemical manufacturer, distributor, or importer provide Safety Data Sheets (SDSs) (formerly MSDSs or Material Safety Data Sheets) for each hazardous chemical to downstream users to communicate information on these hazards (OSHA Brief). As discussed in the response to Comment 22 in Chapter 24 of the FEIS (page 24-16), the data sheets will be manufacturer specific and not available until after a construction contract is issued. All materials to be used for the breakwaters will be permitted and approved.

NATURAL RESOURCES

Comment 41: Chapter 9 briefly mentions that a post-construction monitoring plan and adaptive management plan will be developed in consultation with the appropriate agencies to assess the use of breakwater segments by target species groups and fish and benthic communities adjacent to the breakwater structures. EPA commented on the importance of post-construction monitoring during the pre-final EIS comment period. Our comment stated, "The project sponsor has not yet demonstrated that the breakwaters will be 'self-mitigating,' that they will provide an 'uplift' of the site's current ecological value, and what criteria will be used to evaluate these questions. The sponsor will need to develop a post-construction ecological monitoring and assessment protocol, with quantitative project performance goals and regional reference location(s) for comparison with assessment results." EPA is encouraged to see reference to post-construction monitoring in Chapter 9, however, the intention of our comment was that the FEIS should include monitoring plans in the Appendices, or at a minimum, include basic monitoring plan details so that other entities have the opportunity to review and comment on them. (USEPA_7/13/18)

Response: Appendix K of the FEIS summarizes and responds to the agency comments received on the pFEIS. Please see response to Comment 3 in Appendix K.

Comment 42: If you build a breakwater parallel to the shore, the current will travel closer to shore and may increase beach erosion. The water traveling in the incoming and outgoing tides closer to shore on the shore side of the breakwater may move faster than on the shipping channel side because of the breakwater. The water traveling

in the Hudson River canyon travels closer to Staten Island than Brooklyn. The structures may increase beach erosion. (Hartigan_7/16/18)

Response: Please see the response to Comment 33 in Chapter 24 of the FEIS (page 24-23).

Comment 43: We are concerned with the likelihood of harmful effects afforded by unwelcome fauna whose primary if not solitary predilection for precisely the sort of morsels served along the reefs is a matter of public record. This breeding/feeding process would likely involve a major issue with Gulls, whose habits of scavenging and gregarious traits present major health concerns. At times preferring blood to more banal menus, they have been known to attack humans and their pets in aggressive groups, nest in cooperative colonies along shorelines and particularly prefer exactly what the proposed breakwaters would seem to tantalizingly provide in abundance.

Having one of the longest life expectancies of bird species (up to 49 years), the waters adjacent to the reefs would harbor their favorite culinary delights, providing a conveniently located "open for business" seaside diner, only a few seconds flight from some of their favorite perches and overnight roosts, rooftops and backyard barbecues. Ever been "decorated from above", "mugged for your sandwich" or wakened at 4AM by a squawking flock of scavenging predators?

Gulls vigorously safeguard offspring with aggressive behavior. Return to same nesting site for many years. Large noisy flocks, sleep atop homes, breeding on islands and coastal beaches. Frequently an infestation problem on islands and beaches. Communicate loudly, screech and squawk. If it breathes, grows or moves, or did so recently, its dinner. Gulls have damaged roofs and gutters and blocked gas flues with nesting materials which have caused serious consequences when they are prevented from venting properly. We are faced with the probability of creating Frankenstein monsters by our providing ideal feeding/ nesting sites. Gulls high reproductive success, coupled with incredibly flexible feeding habits, means populations are skyrocketing. (Petersen_Report from Tottenville Beach)

Response: As noted in Chapter 9 "Natural Resources" of the FEIS, there are three species of gull documented or expected to occur in the study area: ring-billed gull, great black-backed gull, and the herring gull (pages 9-57 to 9-58). The breeding range of the ring-billed gull in New York State is limited to the Great Lakes region, so the proposed project does not have the potential to increase ring-billed gull nesting activity on Tottenville Beach. Great black-backed and herring gulls nest within New York City (Fowle and Kerlinger 2001), occasionally including Staten Island (NYSDEC 2000-2005 Breeding Bird Atlas). However, past nesting of these species that was documented by the 2000-2005 NYSDEC Breeding Bird Atlas on or near Staten Island was limited to offshore islands in the Kill Van Kull and lower NY Harbor, and more recent surveys have not documented any great black-backed or herring gulls nesting anywhere on or offshore from Staten Island (e.g., Winston 2015, 2016, 2017 [NYC Audubon Harbor Heron Surveys]).

Breeding populations of these species in New York City have not been skyrocketing, as stated in the comment, but have in fact declined precipitously at many colonies over the past two decades (e.g., Winston 2015, 2016, 2017). Statewide, their populations appear to now be steady after almost being extirpated in the first half of the 20th century (NYSDEC 2000-2005 Breeding Bird Atlas). Nesting of great black-backed and herring gulls in New York City is mainly limited to small offshore islands, where they are relatively free from human disturbance, and nesting on the mainland is rare (e.g., Winston 2015, 2016, 2017). For all of these reasons, and given the levels of human activity and lack of preferred nesting habitat on Tottenville Beach, the project will not increase the abundance of breeding gulls during the summer.

Non-breeding great black-backed, herring, and ring-billed gulls that forage on and offshore from Staten Island are also unlikely to increase in abundance as a result of the proposed project's coastal restoration activity. All three of these species of gulls are generalists that are drawn to degraded habitats and areas of high human activity, such as landfills, beaches with extreme levels of recreational use, and littered and human-altered shorelines in urban areas. Tottenville Beach and its nearshore waters can currently be described as a heavily degraded coastal ecosystem that favors generalist, synanthropic waterbirds like gulls as well as Canada geese, double-crested cormorants, and the like. The proposed breakwater and dune restoration will eventually help to increase marine and coastal biodiversity, and reestablish a more balanced and intact food web. This will reduce the conditions that currently favor use by, and attract disturbance-tolerant generalists like gulls, Canada geese and double-crested cormorants. As such, the proposed project is unlikely to increase, and may instead decrease, the current abundance of gulls and degree of human-gull conflict.

Comment 44: When gulls eat anything infectious, they puke it up. Gulls can drink seawater. Gulls carry a host of superbugs through the skies, migrating hundreds of thousands of miles carrying antibiotic resistant bacteria special delivery to their favorites of the conveniently located Tottenville Breakwater homesites. HVAC systems can spread airborne spores into homes and commercial occupancies. There are 83 different species of harmful bacteria in gull droppings. 90% of seagull feces contain Enterococcus, causing antibiotic resistant infections. Airborne spores from drying gull droppings cause several thousand cases of Salmonella a year. Airborne gull particles are a fungi and bacteria breeding ground for infectious agents. There is no known cure for internal fungal infections. Gull fecal droppings can enter an open wound or cut and result in severe blood sepsis or internal infection. Transmissible disease associated with gull droppings include: Histoplasmosis - respiratory disease that may be fatal. Candidiasis - infects respiratory system, intestine and urogenital tract. Cryptococcosis - pulmonary disease and infection of Central Nervous System.

Encephalitis - inflammation of nervous system - may result in paralysis, coma or death. (Petersen_Report from Tottenville Beach)

Response: Please see the response to previous comment and to Comment 103 in Chapter 24 of the FEIS (page 24-62).

Comment 45: In most of your descriptions you show seals on the breakwater rocky structure. If you increase the habitat for seals, then you will increase food for its main predator – the Great White shark. Since the breakwater is close to shore, there should be concern that there could be shark increase contact with beach goes. In Cape Cod there has been no seal hunting, so the shark population has exploded 10 fold thus more great whites. Take a look at the video of the Great White shark attack on a seal close to shore in Cape Cod. One solution may be a breakwater that is just below the surface at low tide similar to a sand bar on the ocean which causes the waves to break further from shore. (Hartigan_7/16/18)

Response: As noted in Chapter 9 of the FEIS, the only shark species that occur within the study area are sandbar sharks, smooth dogfish, and spiny dogfish (Table 9-10, pages 9-48 and 9-49), none of which prey on seals.

Great white sharks are not known to occur in Raritan Bay. As noted in the comment, gray seals in New England and Canada were released from hunting pressure. This release resulted in large increases to gray seal populations in the region and re-establishment of sizable seal colonies along Cape Cod, leading to an increase in great white shark abundance in the area. These sharks have exceptional olfactory detection and are believed to locate pinniped colonies by the characteristic smell generated by large aggregations of these animals (Strong et al. 1992, Hammerschlag et al. 2006).

While seals may use the breakwaters as haul-out sites, particularly given the potential for higher foraging opportunities around the structures, the increase in haul-out habitat and concentration of foraging opportunities is not expected to result in an increase in seal populations in the region. Given the amount of shoreline available in the Raritan Bay area, seal populations are not limited by haul-out habitat availability. Therefore, providing additional haul-out sites would not affect seal abundance in the region. Additionally, seals are generally seasonal visitors, arriving in late fall and departing in early spring (CWFNJ 2018, NYSDEC 2018). Great white sharks do not tolerate water temperatures below 54°F (12°C). In Raritan Bay, waters become too cold for great white sharks in November and remain below their tolerance through April. Therefore, when seals are present in Raritan Bay, water temperatures are not suitable for great white sharks.

SEWER AND WATER INFRASTRUCTURE

Comment 46: The existing storm water drainage system serving the Tottenville beachfront, newly installed only 24 years ago, has demonstrated itself to be incapable of

handling heavy rains since the temporary berm was installed, and thus far the DEP has found the problem to be intractable. What will become of this standing, storm-delivered water when flooding and sand clogged outfalls and a 16 foot high stone cored berm are added to the mix, forming our own Tottenville Beach Bowl? (Petersen_Report from Tottenville Beach)

This project will not fix the situation with the outfalls that are constantly being clogged with sand so the water can not go out. (Crispi_6/27/18)

I'm the third generation living on this shoreline the biggest problem or the storm water outfalls these outfalls keep washing away the shoreline which is taking away our protection. I sent them pictures and specs on how to fix these outfalls this is what other states are doing to give their communities shoreline protection. (Halvorsen_6/24/18)

This money needs to go towards the biggest problem we have and that's the storm water outfalls. These outfalls are the major cause of the beach erosion why are you not investing this money to fix this problem. (Halvorsen_6/23/18)

Response: Please see the responses to Comments 16, 37, 68, and 150 in Chapter 24 of the FEIS (pages 24-13, 24-25, 24-45, and 24-84, respectively). The purpose and need of the Breakwaters and Shoreline Projects are targeted at coastal risks. However, as part of the research being done for the final design of the Shoreline Project, GOSR is undertaking, in coordination with DEP, a study of the functioning of the outfalls in the area. The information obtained would ensure that the proposed resiliency measures do not further tax the area's drainage system and may provide information useful to enhance the current system. Coordination with DEP regarding regular maintenance of the system to avoid flooding during storm events is ongoing.

With respect to the heights of the various Shoreline Project elements, please see the response to Comment 35 above.

Comment 47: A decision had been made and was implemented to construct a "temporary berm", using "trap bags" and sand along the shoreline's naturally-occurring primary dune, raising the elevation of the berm about seven to ten feet. The very first heavy rainfall, which followed a month or so the completion of the berm, presented a major drainage issue, with water backing up a block to Billop Ave, covering the sidewalks and entering the more vulnerable of the homes' living areas, requiring six to ten hours to recede. In spite of the repeated drainage disaster events which has continued to plague the beach area to this day since the berm's placement, and for which complaints were received by the NYCDEP, this very serious matter dangerous to residents' health and property remains unabated.

A second but more practical corollary of porosity will be the role of rainfall volume anticipated in both the heavy rainfalls experienced six or more times annually which currently result in flooding living quarters. …It is this

phenomenon's logical result that would likely create a similar condition as the berm's pores clogged with debris to the same extent as had previously impeded the flow through the storm drain catch basins

What has been the Project's response to the constant ponding from heavy rainfall experienced by beach residents as the rising water enters their homes since the building of the temporary Berm and would seem to be likely exacerbated by a permanent, even taller and wider replacement? (Petersen_Report from Tottenville Beach)

Response: As described in Chapter 11, "Sewer and Water Infrastructure" of the FEIS, unlike the temporary dune system, the Shoreline Project has been designed to be porous. Please see the responses to Comments 68 and 150 in Chapter 24 of the FEIS (pages 24-45 and 24-84, respectively).

CONSTRUCTION

Comment 48: The Air Quality section of the Construction impacts (Chapter 17) explains the methodology used to evaluate the applicability of General Conformity to the project. In general, the approach as described for estimating emissions is appropriate, employing the latest EPA models. However, the report does not appear to be explicit about some key inputs, therefore the analysis cannot be reproduced. The following are not specified: the type, age and size of equipment and engines, the assumed activity (operating hours or miles traveled), and emission and load factors used. These details are necessary to demonstrate a complete evaluation. Chapter 24 – Responses to Comments on the DEIS states that additional details were added to Appendix I of the FEIS to address these concerns, however the document does not include an Appendix I. (USEPA_7/13/18)

Response: Prior to the completion of the FEIS, a preliminary Final Environmental Impact Statement (pFEIS) was prepared to address refinements made to the project, as well as all substantive comments made on the DEIS during the public review period (including the USEPA comment regarding General Conformity referenced above). The pFEIS was circulated to cooperating, involved and interested agencies for review (including USEPA), and additional consultation was subsequently conducted based on comments received. Appendix I was submitted as part of the pFEIS submission. In addition, the June 2018 FEIS, including Appendix I was available on USEPA's website, and a complete electronic copy of the FEIS was submitted to USEPA's Region 2 offices. It is also available at https://stormrecovery.ny.gov/environmental-docs.

INDIRECT AND CUMULATIVE EFFECTS

Comment 49: EPA maintains that the cumulative effects section does not provide a detailed quantitative analysis of past, present, and reasonably foreseeable projects. While pages 21-7 to 21-9 provide a list of some of the actions within or in close

proximity of the study area, there isn't a substantive discussion of how the projects could contribute to cumulative impacts of the proposed action within the section. We refer you to the recently published Draft EIS for the Meadowlands Flood Protection RBD project which includes an excellent cumulative effects section. (USEPA_7/13/18)

Response: Pages 21-7 through 21-9, as mentioned in the comment, provide a list of past, present, and reasonably foreseeable future actions with relevant study areas. The cumulative effects of the projects listed on those pages with the Proposed Actions appear on the subsequent pages and are discussed within the analysis of each relevant technical area. Given the limited scope and nature of past, present and future actions, detailed quantitative analyses were not required to analyze the potential for cumulative impacts with the Proposed Actions. In addition, in consultation with USEPA following the comment period of the DEIS, the analysis approach was confirmed and revised to include a map of the projects listed, to better illustrate the locations of these actions, as well as expanded analyses of potential cumulative effects in the relevant technical analysis areas. Prior to the completion of the FEIS, the revised chapter was included as part of the submission of the pFEIS to cooperating, involved and interested agencies for review (including USEPA).

MISCELLANEOUS

Comment 50: Who and where is the money coming from to maintain this project. (Halvorsen_6/24/18)

Response: Please see the responses to Comments 23 and 24 in Chapter 24 of the FEIS (pages 24-16 and 24-20, respectively).

Comment 51: Once placed, these Breakwaters would require another big bite from the Money Tree to remove when they fail to perform, or perform too well as instruments of destruction, and no doubt, encounter another groundswell of objections from the oyster huggers, referencing ecological concerns. (Petersen_Report from Tottenville Beach)

Response: A post-construction monitoring plan and adaptive management plan is being developed to assess the structural integrity and condition of breakwater structures, their effectiveness at attenuating storm waves and reducing shoreline erosion, along with establishing what corrective measures may be needed should an issue arise and when such corrective measures should be implemented. Future determination of any need for modification(s) to the breakwater structures would be in accordance with the Adaptive Management Plan developed for the project. These plans will be more fully developed in consultation with NYSDEC, NMFS and USACE during the permitting process. Additionally, please see the response to Comments 23 and 24 in Chapter 24 of the FEIS (page 24-16 and 24-20,

respectively) regarding the parties responsible for maintenance (and thus, monitoring) of the project components.

GENERAL SUPPORT

Comment 52: As a cooperating agency for this project, EPA has attended scoping meetings, interagency meetings, and has provided comments on preliminary draft chapters. Our comment letter on the Draft Environmental Impact Statement was submitted on May 5, 2017 with a rating of EC-2 (Environmental Concerns – Insufficient Information). On September 12, 2017, EPA participated in a conference call with GOSR and HUD to discuss the comments on the DEIS. EPA appreciates and acknowledges the revisions that have been made, and finds that our comments on the DEIS as well as the pre-Final EIS chapters have been addressed. Specifically, the concerns we raised regarding compliance with the Endangered Species Act and the Magnuson Stevens Act have been resolved in the FEIS. In addition, Chapter 1 better evaluates a variety of breakwater alternatives including sills and constructed reefs. (USEPA_7/13/18)

Response: Comment noted.

Comment 53: As co-chair of the Living Breakwaters Citizens Advisory Committee, I am writing in full support of the Rebuild by Design Living Breakwaters Project. As a Staten Island resident on the south shore, committed to enhancing the quality of life and resilience of the borough, I urge the Governor's Office of Storm Recovery to proceed to final design and construction of its plan for breakwaters and treatments along the shoreline to reduce wave action, erosion and coastal flooding of the shoreline at Tottenville.

The Governor's Office of Storm Recovery has diligently and thoroughly designed the project to increase marine habitat while maximizing the systems function to reduce storm risk, and to generate public understanding of the ecology of the estuary at the junction of the Lower New York Harbor and Raritan Bay. Many public meetings have been held and continue to be held locally throughout the process, in which resident concerns are listened to and taken into consideration. This has resulted in a strong project that reflects community input in its design. I look forward to the completion of this project for the benefit of the local community, the entire borough of Staten Island, and New York City as a whole. (CAC_7/16/18)

Response: Comment noted.

Comment 54: As a resident of Staten Island, please consider the following in regards to the Rebuild by Design Living Breakwaters Project. This project offers exciting opportunities for other residents of Staten Island, as well as visitors to Tottenville, to learn first-hand about the diverse ecology of the Tottenville shoreline that will experience reduced wave action and erosion after breakwaters are constructed offshore. Additionally, the project will be a model for students, public officials

and professionals who want to learn about creative strategies for coastal resilience in a time and in an area increasingly affected by climate change. For these reasons, I avidly support approval of the project and look forward to its construction. (M. Larsen_7/16/18)

Response: Comment noted.

Comment 55: Rebuild by Design is pleased to recommend that the Governor's Office of Storm Recovery (GOSR) issue a Record of Decision that leads to the release of funding for the final design, construction and implementation of the Living Breakwaters Project described in the Final Environmental Impact Statement that GOSR issued on June 13, 2018. (Rebuild by Design_7/13/18)

Response: Comment noted.

Comment 56: I fully support the federally-funded Living Breakwaters/Tottenville Shoreline Protection Project managed by the Governor's Office of Storm Recovery (GOSR).

I had the pleasure of touring the site with HUD Regional Administrator Lynn Patton and meeting with GOSR staff last fall. In my opinion, the Living Breakwaters/Tottenville Shoreline Protection Project will greatly reduce coastal risk for Staten Island's South Shore community by counteracting erosion and attenuating storm waves, while also enhancing its marine ecology and promoting environmental awareness.

My office has been tracking the project's progress and I'm impressed by the degree of community engagement and involvement that has taken place since the project's inception. It's just this kind of back-and-forth that makes publicly-funded projects successful, particularly one intended to reduce the disastrous consequences of a storm like Superstorm Sandy.

It's my understanding that the Final Environmental Impact Statement has been reviewed by and completed in consultation with 10 federal, state, and local government agencies. While I'm not an engineer, the plans developed by the project team seem sound and I am confident that the proposed designs will accomplish their intended purpose.

I fully support the Living Breakwaters/Tottenville Shoreline Protection Project and look forward to continuing to follow GOSR's progress. (Donovan_7/16/18)

Response: Comment noted.

Comment 57: As an individual interested in the continued wellbeing of Staten Island's coastal communities, I wholeheartedly support the Rebuild by Design Living Breakwaters Project. The planned project will reduce flood risk along Tottenville's shoreline, while provided new habitat and exciting opportunities for fishing. Along the shoreline, the community will benefit from new coastal

defenses within Conference House Park as well as access to the waterfront. Over time, the breakwaters will limit erosion and build back our beaches, enhancing the park and improving the quality of life for the residents that live here. The Living Breakwaters project was designed as an innovative approach to coastal resiliency and New York State should advance the project to final design and construction, leading the way for these types of projects to be built across our region. (C. Larsen_7/16/18)

Response: Comment noted.

Comment 58: I write in support of the Rebuild by Design Living Breakwaters Project. As an individual committed to enhancing the quality of life in Staten Island, I urge the Governor's Office of Storm Recovery to proceed to final design and construction of its plan for breakwaters and treatments along the shoreline to reduce wave action, erosion and coastal flooding of the shoreline at Tottenville. The Governor's Office of Storm Recovery has diligently and thoroughly designed the project to increase marine habitat while maximizing the systems function to reduce storm risk, and to generate public understanding of the ecology of the estuary at the junction of the Lower New York Harbor and Raritan Bay. I look forward to the completion of this project. (Bruno_7/16/18)

Response: Comment noted.

Comment 59: As an individual and life-long resident interested in the continued wellbeing of Staten Island's coastal communities, I wholeheartedly support the Rebuild by Design Living Breakwaters Project. The planned project will reduce flood risk along Tottenville's shoreline, while provided new habitat and exciting opportunities for fishing. Along the shoreline, the community will benefit from new coastal defenses within Conference House Park as well as access to the waterfront. Over time, the breakwaters will limit erosion and build back our beaches, enhancing the park and improving the quality of life for the residents that live here. The Living Breakwaters project was designed as an innovative approach to coastal resiliency and New York State should advance the project to final design and construction, leading the way for these types of projects to be built across our region. (Cerullo_7/16/18)

Response: Comment noted.

Comment 60: I write in support of the Rebuild by Design Living Breakwaters Project. As an individual committed to enhancing the quality of life in Staten Island, I urge the Governor’s Office of Storm Recovery to proceed to final design and construction of its plan for breakwaters and treatments along the shoreline to reduce wave action, erosion and coastal flooding of the shoreline at Tottenville. Along the shoreline, the community will benefit from new coastal defenses within Conference House Park as well as access to the waterfront. The Governor’s Office of Storm Recovery has diligently and thoroughly designed the project to increase

marine habitat while maximizing the systems function to reduce storm risk, and to generate public understanding of the ecology of the estuary at the junction of the Lower New York Harbor and Raritan Bay. The Living Breakwaters project was designed as an innovative approach to coastal resiliency and New York State should advance the project to final design and construction, leading the way for these types of projects to be built across our region. I look forward to the completion of this project. (Lipuma_7/5/18).

Response: Comment noted.

Comment 61: I am a marine science educator who has been teaching the general public, school students, teachers and families about the necessity of protecting, preserving and enhancing our coastal habitats and neighboring communities for 40 years.

As an individual and Executive Board Member of the New York State Marine Education Association (NYSMEA.org) I support any efforts that will help sustain the wellbeing of Staten Island's coastal communities. I wholeheartedly support the Rebuild by Design Living Breakwaters Project. The planned project will reduce flood risk along Tottenville's shoreline, while providing new habitat and exciting opportunities for fishing along the shoreline. Oyster reefs are keystone species that will help to encourage the settlement of other marine organisms, as well as buffer the threat of ocean acidification. The community will benefit from new coastal defenses within Conference House Park as well as access to the waterfront. Over time, the breakwaters will limit erosion and build back our beaches, enhancing the park and improving the quality of life for the residents that live here. The Living Breakwaters project was designed as an innovative approach to coastal resiliency and New York State should advance the project to final design and construction, leading the way for these types of projects to be built across our region.

Of course I do realize the living breakwaters will have little effect or none at all on mitigating severe damage and flooding from major storms such as Hurricane Sandy, but these structures will help reduce small incremental natural erosion processes that occur slowly from season to season over time. The installation of oysters will also help to improve water quality along the shoreline. (Kafka_7/6/18)

Response: Comment noted.

Comment 62: I strongly support the Living Breakwaters/Tottenville Shoreline Protection Project. I am a Staten Island resident living within a block of the shoreline. My husband, son and two daughters and I had to run for our lives and evacuate our home on the night of Superstorm Sandy. The first floor of our home was flooded and many of our personal belongings destroyed. This plan wisely takes steps to safeguard the community and improve our use and enjoyment of our nearby parks. Please proceed with the project as quickly as possible (Falco_7/16)

Response: Comment noted.

Comment 63: As an individual that experienced the impact of Hurricane Sandy first hand on the shores of Staten Island, I urge you to approve the Living Breakwaters project. Staten Island's coastal resources are a valuable and integral part of our island community. I believe this project will support the continued wellbeing of Staten Island's coastal communities, and wholeheartedly support the Rebuild by Design Living Breakwaters Project.

The planned project proposed an exceptionally innovative and habitat friendly approach to reduce flood risk along Tottenville's shoreline. Our communities will benefit from new coastal defenses within Conference House Park as well as essential ongoing access to the waterfront. Over time, with this more creative approach, the breakwaters will naturally grow to limit erosion and build back our beaches, enhancing the park and improving the quality of life for all of Staten Island who can access and use these resources.

The Living Breakwaters project holds out the promise of being one of the most innovative solutions to what had been a disaster for Staten Island. I hope that New York State will move quickly to advance the project to final design and construction, leading the way for these types of projects to be built across our region. (Brown_7/3/18)

Response: Comment noted.

Comment 64: On behalf of the Waterfront Alliance, I am writing in support of the Living Breakwaters Project, to reduce flood risk along Tottenville's shoreline, with new coastal defenses within Conference House Park, and increased access to the waterfront for Staten Islanders. The Living Breakwaters project was designed as an innovative approach to coastal resiliency and New York States should advance the project to final design and construction, leading the way for these types of projects to be built across our region

As the project proceeds towards implementation, it is important to ensure that habitat lost or converted is adequately mitigated in accordance with the damage. Given the significance of this project and its position as a precedent, it is important that a program and funds remain allocated for monitoring the project's habitat quality and its effectiveness in achieving proposed goals over time.

We urge the Governor's Office of Storm Recovery to strongly pursue identifying funds to monitor this important project's progress over time. (Waterfront Alliance_7/16/18)

Response: Comment noted. A monitoring plan and adaptive management plan would be finalized as part of the permitting process in consultation with NYSDEC. NYC Parks would be responsible for the shoreline elements, and NYSDEC would be responsible for the breakwaters. If identified through monitoring, any structural

or performance issues associated with the project components would be remedied according to the adaptive management plan.

Comment 65: I am writing in response to FEIS on the Living Breakwaters and Tottenville Shoreline Protection Project. I am in total support of Alternative 2 listed in Chapter 9. Alternative 2 includes the Living Breakwaters Reef System, the Waterhub and the Tottenville Shoreline Protection Project. These projects offer Tottenville a connected community to the waterfront, an opportunity to educate children about the marine ecosystem and provide protection to our fragile shoreline. I am in absolute support of this layered strategy.

Tottenville residents have always wanted a place to go by the waterfront to walk, to jog, and to bike ride. Since Superstorm Sandy, the residents have lost this ability. The proposed earthen berm and hybrid dune/revetment system trails would provide all Tottenville residents an opportunity to connect with the waterfront and have a place to enjoy walking by the water's edge. This opportunity should not be limited to the people who own property by the Conference House Park, the park should be accessible to all Tottenville residents. It is a shame how a few of the home owners that have access to the park through their backyards are trying to stop this project. This project as stated in the FEIS does not adversely impact the quiet, residential nature of the community. This project's fate should not be determined by a few homeowners, it should be determined by what is for the good of the community as a whole, not just for a few. This dune/revetment system is a win-win project. It provides the Tottenville Community a place to connect to the water/beach and it provides protection against rising waters and storm surges. Wasn't it enough that we lost two lives during Sandy? How could we not want to prevent that from ever happening again?

The Living Breakwaters and Water Hub are essential to the ecosystem and our educational future. The Living Breakwaters allows us to lessen erosion/wave action and put back organisms into our ecosystem that have been gone. There are only benefits from installing the Living Breakwaters. There is no argument not to install them. The Water Hub allows educators to bring students to learn about ecosystems and the restoration of them. There is no greater lesson than a student being able to connect what they learned in a classroom and experiencing it for themselves. This is an educators dream, bringing students to the waterfront to "do science" is invaluable. The push for students to be exposed to real life science learning has never been greater. As a community how do we not support our future scientists? To inspire young students to care and make connections about their community and the natural world is vital for our future.

I am a lifelong educator and resident of Tottenville. I do not speak for my benefit; I speak for the benefit of the entire Tottenville Community. Please choose Alternative 2 for the Living Breakwaters and Tottenville Shoreline Project, Tottenville needs this project for a better community and a better future. (Amoroso_7/7/18)

Response: Comment noted.

C. REFERENCES

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Fowle, M.T., and P. Kerlinger. 2001. The New York City Audubon Society Guide to finding birds in the Metropolitan area. Cornell University Press, Ithaca. 230 pp.

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Winston, T. 2015. New York City Audubon's Harbor Herons Project: 2015 Nesting Survey Report. December 2015.

Winston, T. 2016. New York City Audubon's Harbor Herons Project: 2016 Nesting Survey Report. December 2016.

Winston, T. 2017. New York City Audubon's Harbor Herons Project: 2017 Nesting Survey Report. December 2017.

Attachment B: List of Commenters

Attachment B List of Commenters

AGENCIES AND ELECTED OFFICIALS

1. New York State Historic Preservation Office (SHPO), letter from Larry Moss dated June 20, 2018
2. New York City Landmarks Preservation Commission (LPC), letter from Gina Santucci dated June 12, 2018
3. United States Environmental Protection Agency (USEPA), letter from Judy-Ann Mitchell dated July 13, 2018
4. Representative Daniel M. Donovan, Jr., House of Representatives (NY-11), letter dated July 16, 2018

ORGANIZATIONS AND BUSINESSES

5. Rebuild by Design, letter from Amy Chester dated July 13, 2018
6. Living Breakwaters Citizens Advisory Committee (CAC), email from Victoria Cerullo dated July 16, 2018
7. Waterfront Alliance, letter from Roland Lewis dated July 16, 2018

GENERAL PUBLIC

8. Debra Amoroso, email dated July 7, 2018
9. Leslie Brown, email dated July 3, 2018
10. Thomas Bruno, email dated July 16, 2018
11. Scott Cerullo, email dated July 16, 2018
12. Patricia Crispi, email dated June 27, 2018
13. Kathleen Falco, email dated July 16, 2018
14. E. Giordano, email dated June 13, 2018
15. Michael Greco, emails dated June 19, 2018; June 20, 2018; June 21, 2018; July 4, 2018; July 6, 2018; July 10, 2018, July 11, 2018 and July 16, 2018
16. Kerry Halvorsen, emails dated June 23, 2018 and June 24, 2018 (multiple), June 30, 2018
17. Joe Hartigan, email dated July 16, 2018
18. Merryl Kafka, email dated July 6, 2018
19. Caitlin Larsen, email dated July 16, 2018
20. Martin Larsen, email dated July 16, 2018
21. Sarah Lipuma, email dated July 5, 2018

22. Michael Panarello, emails dated June 24, 2018 (multiple)
23. John Petersen, emails dated June 19, 2018 (Report from Tottenville Beach) and July 16, 2018 (Report from Tottenville Beach, with "Summary Conclusion")

Attachment C: Comments Received on Final Environmental Impact Statement

NEW YORK STATE OF OPPORTUNITY. | Parks, Recreation, and Historic Preservation

ANDREW M. CUOMO
Governor

ROSE HARVEY
Commissioner

June 20, 2018

Mr. Daniel Greene
Governor's Office of Storm Recovery
25 Beaver St
New York, NY 10004

Re: GOSR/ CDBG-DR
Rebuild by Design (RBD) Living Breakwaters Project
and the Tottenville Shoreline Protection Project.
Tottenville Shoreline from Brighton Street to Joline Ave, Staten Island/
Richmond County
15PR00618

Dear Mr. Greene:

Thank you for continuing to consult the New York State Historic Preservation Office (SHPO). We have reviewed the provided documentation in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources.

We have reviewed the scope of work and supporting documents submitted to our office to date. Based upon our review, SHPO continues to recommend a Phase IB archaeological investigation of certain portions of the APE, as described in the Phase IA report.

If you have any questions, I can be reached at (518) 268-2187 or Larry.moss@parks.ny.gov

Sincerely,

L Moss

Larry K Moss, Historic Preservation Technical Specialist

CC: Mary Barthelme
Amanda Sutphin, LPC
Daniel Pagano, LPC
Gina Santucci, LPC
Amy Diehl Crader, AKRF
Claudia Cooney, AKRF
Elizabeth Meade, AKRF
JoLayne Morneau, AKRF

Landmarks Preservation Commission

1 Centre Street
9th Floor North
New York, NY 10007

Voice (212)-669-7700
Fax (212)-669-7960
http://nyc.gov/landmarks

ENVIRONMENTAL REVIEW

Project number: GOVERNOR OFFICE STORM RECOVRY / 15OSR001R
Project: LIVING BREAKWATERS AND TOTTENVILLE DUNE PROJECTS
Date received: 6/12/2018

Comments: The LPC is in receipt of the final EIS dated June 2018. The text for architectural and archaeological resources appears acceptable.

Cc: SHPO

Gina Santucci 6/20/2018

SIGNATURE DATE
Gina Santucci, Environmental Review Coordinator

File Name: 30215_FSO_ALS_06132018.doc

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

JUL 13 2018

Mr. Daniel Greene
General Counsel
New York State Governor's Office of Storm Recovery
25 Beaver Street, 5th Floor
New York, NY 10004

Dear Mr. Greene:

In accordance with our responsibilities under the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act, the U.S. Environmental Protection Agency has reviewed the Final Environmental Impact Statement (FEIS) for the Coastal and Social Resiliency Initiative for the Tottenville Shoreline project (CEQ # 20180132).

The document was prepared by the State of New York, Governor's Office of Storm Recovery (GOSR), serving under the auspices of the New York State Homes and Community Renewal's Housing Trust Fund Corporation, and acting under the authority of the U.S. Department of Housing and Urban Development (HUD). The proposed effort includes both the Living Breakwaters Project and the Tottenville Shoreline Protection Project. Both projects have independent merits, however they are located in the same geographic area and are intended to be implemented simultaneously to maximize resiliency of the shoreline. The Breakwaters project was awarded $60 million through HUD's Rebuild by Design (RBD) competition. In addition, approximately $9.3 million of Community Development Block Grant-Disaster Recovery (CDBG-DR) funds from the NY Rising Community Reconstruction Program will be used to implement this project.

As a cooperating agency for this project, EPA has attended scoping meetings, interagency meetings, and has provided comments on preliminary draft chapters. Our comment letter on the Draft Environmental Impact Statement was submitted on May 5, 2017 with a rating of EC-2 (Environmental Concerns – Insufficient Information). On September 12, 2017 EPA participated in a conference call with GOSR and HUD to discuss the comments on the DEIS. EPA appreciates and acknowledges the revisions that have been made, and finds that our comments on the DEIS as well as the pre-Final EIS chapters have been addressed. Specifically, the concerns we raised regarding compliance with the Endangered Species Act and the Magnuson Stevens Act have been resolved in the FEIS. In addition, Chapter 1 better evaluates a variety of breakwater alternatives including sills and constructed reefs. There are a few remaining issues, however, that we would like to highlight.

Chapter 9 briefly mentions that a post-construction monitoring plan and adaptive management plan will be developed in consultation with the appropriate agencies to assess the use of breakwater segments by target species groups and fish and benthic communities adjacent to the breakwater structures. EPA commented on the importance of post-construction monitoring during the pre-final EIS comment period. Our comment stated, "The project sponsor has not yet demonstrated that the breakwaters will be 'self-mitigating', that they will provide an 'uplift' of the site's current ecological value, and what criteria will be used to evaluate these questions. The sponsor will need to develop a post-construction ecological monitoring and assessment protocol, with quantitative project performance goals and regional reference location(s) for comparison with assessment results." EPA is encouraged to see reference to post-construction monitoring in Chapter 9, however, the intention of our comment was that the FEIS should include monitoring plans in the Appendices, or at a minimum, include basic monitoring plan details so that other entities have the opportunity to review and comment on them.

The Air Quality section of the Construction impacts (Chapter 17) explains the methodology used to evaluate the applicability of General Conformity to the project. In general, the approach as described for estimating emissions is appropriate, employing the latest EPA models. However, the report does not appear to be explicit about some key inputs, therefore the analysis cannot be reproduced. The following are not specified: the type, age and size of equipment and engines, the assumed activity (operating hours or miles traveled), and emission and load factors used. These details are necessary to demonstrate a complete evaluation. Chapter 24 – Responses to Comments on the DEIS states that additional details were added to Appendix I of the FEIS to address these concerns, however the document does not include an Appendix I.

EPA maintains that the cumulative effects section does not provide a detailed quantitative analysis of past, present, and reasonably foreseeable projects. While pages 21-7 to 21-9 provide a list of some of the actions within or in close proximity of the study area, there isn't a substantive discussion of how the projects could contribute to cumulative impacts of the proposed action within the section. We refer you to the recently published Draft EIS for the Meadowlands Flood Protection RBD project which includes an excellent cumulative effects section.

Thank you for the opportunity to comment on the FEIS for the Rebuild by Design Coastal and Social Resiliency Initiative for Tottenville Shoreline project. If you have any questions regarding this review, please contact Stephanie Lamster of my staff at (212) 637-3465 or at lamster.stephanie@epa.gov.

Sincerely,

Judy-Ann Mitchell, Chief
Sustainability and Multimedia Programs Branch

cc: Donna Mahon, HUD

DANIEL M. DONOVAN, JR.
11th District, New York

1725 Longworth Building
Washington, DC 20515
(202) 225-3371

265 New Dorp Lane
Second Floor
Staten Island, NY 10306
(718) 351-1062

7308 13th Avenue
Brooklyn, NY 11228
(718) 635-5277

COMMITTEE ON HOMELAND SECURITY
Subcommittee on Emergency Preparedness, Response, and Communications
Subcommittee on Cybersecurity, Infrastructure Protection, and Security Technologies

COMMITTEE ON FOREIGN AFFAIRS
Subcommittee on Africa, Global Health, Global Human Rights, and International Organizations
Subcommittee on the Western Hemisphere

http://donovan.house.gov

Congress of the United States
House of Representatives
Washington, DC 20515

July 16, 2018

Mr. Daniel Greene
General Counsel
NYS Governor's Office of Storm Recovery
25 Beaver Street, 5th Floor
New York, New York 10004

Re: Support for the Living Breakwaters project

Dear Mr. Greene:

I fully support the federally-funded Living Breakwaters/Tottenville Shoreline Protection Project managed by the Governor's Office of Storm Recovery (GOSR).

I had the pleasure of touring the site with HUD Regional Administrator Lynn Patton and meeting with GOSR staff last fall. In my opinion, the Living Breakwaters/Tottenville Shoreline Protection Project will greatly reduce coastal risk for Staten Island's South Shore community by counteracting erosion and attenuating storm waves, while also enhancing its marine ecology and promoting environmental awareness.

My office has been tracking the project's progress and I'm impressed by the degree of community engagement and involvement that has taken place since the project's inception. It's just this kind of back-and-forth that makes publicly-funded projects successful, particularly one intended to reduce the disastrous consequences of a storm like Superstorm Sandy.

It's my understanding that the Final Environmental Impact Statement has been reviewed by and completed in consultation with 10 federal, state, and local government agencies. While I'm not an engineer, the plans developed by the project team seem sound and I am confident that the proposed designs will accomplish their intended purpose.

I fully support the Living Breakwaters/Tottenville Shoreline Protection Project and look forward to continuing to follow GOSR's progress.

Sincerely,

Daniel M. Donovan, Jr.

Daniel M. Donovan, Jr.
Member of Congress

Lentz, Amy (STORMRECOVERY)

From: Amy Chester <achester@rebuildbydesign.org>
Sent: Friday, July 13, 2018 10:58 AM
To: nyshcr.sm.nyscdbg.dr.er
Cc: Allen Kratz
Subject: Support of Living Breakwaters FEIS
Attachments: RBD FEIS Living Breakwaters 7.13.18.pdf

Dear Sir or Madam,

Please find attached letter in support of the Living Breakwaters FEIS. if you have any questions, please let us know.

Thank you

Amy

Amy Chester
Managing Director, Rebuild by Design
20 Cooper Sq. Rm 232
New York, NY 10003

Rebuild by Design | Facebook | Twitter
@rebuildbydesign #rebuildstronger

REBUILD
BY
DESIGN

Rebuild by Design
20 Cooper Square, 2nd Fl
New York, NY 10003

July 13, 2018

Via email to: NYSCDBG_DR_ER@nyshcr.org.

First-class mail to:

Governor's Office of Storm Recovery
25 Beaver Street, 5th Floor
New York, NY 10004.

Subject: Living Breakwaters Project -- Comment on Final Environmental Impact Statement

To Whom it May Concern:

Rebuild by Design is pleased to recommend that the Governor's Office of Storm Recovery (GOSR) issue a Record of Decision that leads to the release of funding for the final design, construction and implementation of the Living Breakwaters Project described in the Final Environmental Impact Statement that GOSR issued on June 13, 2018.

Five years ago, in June 2013, the U.S. Department of Housing and Urban Development (HUD) initiated the Rebuild by Design Hurricane Sandy Competition, a process to address devastation from Superstorm Sandy and to advance a comprehensive community planning process that would lead to long-term resilience and climate change adaptation by means of constructing forward-looking,

community-sensitive, well-engineered infrastructure and by enhancement of social-support and educational programs within the affected community.

SCAPE/Landscape Architecture led a team of specialized experts to work with community members and local government to design Living Breakwaters, a project to enhance environmental, social and economic resilience on the southern shore of Staten Island, as described below. The team consisted of Parsons Brinckerhoff, engineering/planning; Stevens Institute of Technology, marine science/ocean modelling; Searc Consulting, marine biology; Ocean and Coastal Consultants, coastal engineering; the New York Harbor School, education/oyster restoration; LOT-EK; architecture; MTWTF, graphic design; and author Paul Greenberg.

In June 2014, this team was one of the seven projects awarded funds from HUD, recognizing the team's collaboration with regional experts, government entities, elected officials, issue-based organizations, local community groups and individuals. Living Breakwaters has received international recognition and awards for its innovative work.

Following the award, the succeeding four years of extensive collaboration with citizens, community representatives and consultants from multiple disciplines have been led by GOSR, which has worked tirelessly to make the SCAPE Team's vision a reality. GOSR has designed the Living Breakwaters plan, detailed in the FEIS, to reduce the risk of wave action and coastal erosion, mitigate the impacts of coastal flooding, and increase the resiliency of the communities and ecosystems along the Tottenville shoreline.

Rebuild by Design is pleased that Living Breakwaters will be built as designed to protect critical infrastructure and facilities, residences, businesses, and ecological resources during hurricanes and other severe weather storm events, and that the project also is designed to enhance aquatic habitats, and stimulate community education regarding coastal resilience.

Among the innovative components of the Living Breakwaters project is its emphasis on off-shore infrastructure: underwater reefs designed to reduce damaging wave action and to support beds for oysters, a maritime species that improves water quality. The "Comprehensive Restoration Plan for the Hudson-Raritan Estuary" that the U.S. Army Corps of Engineers and the Port Authority of New York and New Jersey issued in June 2016 identified the Living Breakwaters project area as having high suitability for oyster reef restoration.

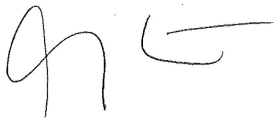
Throughout the planning process, GOSR and its design team have implemented best practices for effective community engagement, including creating of a Citizens Advisory Committee, frequent community meetings, briefings and open houses, multiple methods for gaining community input, effective visualizations of the project as it evolved from concept to design drawings, virtual reality simulations of

underwater construction and the ways in which reefs would reduce wave action and become bedding for oysters, online sharing of the status of the project, collaboration with community groups, and shoreline walks in which citizens developed a greater understanding of the need for the project and collected baseline data regarding wave action and seasonal tide levels.

Living Breakwaters is well positioned, in the words of the FEIS, to "reduce the risk of wave action and coastal erosion, address the impacts of coastal flooding, and increase the resiliency of the communities and ecosystems within the project area, thereby protecting critical infrastructure and facilities, residences, businesses, and ecological resources during hurricanes and other severe weather storm events [and] ...enhance aquatic habitats, and foster community education on coastal resiliency."

Rebuild by Design endorses the Living Breakwaters Project and offers whatever assistance it can to advance final design toward construction and implementation.

Sincerely,



Amy Chester, Managing Director

Lentz, Amy (STORMRECOVERY)

From: Victoria Cerullo <victoria.cerullo@gmail.com>
Sent: Monday, July 16, 2018 9:12 AM
To: nyshcr.sm.nyscdbg.dr.er
Subject: Rebuild by Design Living Breakwaters Project

As co-chair of the Living Breakwaters Citizens Advisory Committee, I am writing in full support of the Rebuild by Design Living Breakwaters Project. As a Staten Island resident on the south shore, committed to enhancing the quality of life and resilience of the borough, I urge the Governor's Office of Storm Recovery to proceed to final design and construction of its plan for breakwaters and treatments along the shoreline to reduce wave action, erosion and coastal flooding of the shoreline at Tottenville.

The Governor's Office of Storm Recovery has diligently and thoroughly designed the project to increase marine habitat while maximizing the systems function to reduce storm risk, and to generate public understanding of the ecology of the estuary at the junction of the Lower New York Harbor and Raritan Bay. Many public meetings have been held and continue to be held locally throughout the process, in which resident concerns are listened to and taken into consideration. This has resulted in a strong project that reflects community input in its design. I look forward to the completion of this project for the benefit of the local community, the entire borough of Staten Island, and New York City as a whole.

Sincerely,
Victoria Cerullo

Lentz, Amy (STORMRECOVERY)

From: Jose Soegaard <jsoegaard@waterfrontalliance.org>
Sent: Monday, July 16, 2018 5:19 PM
To: nyshcr.sm.nyscdbg.dr.er
Subject: Living Breakwaters FEIS
Attachments: Waterfront-Alliance-comment_Living-Breakwaters_FEIS.pdf

Hello,

Attached please find a comment letter from Waterfront Alliance regarding the Living Breakwaters project's Final EIS.

Sincerely,
Jose

WATERFRONT ALLIANCE

Jose Soegaard
Director of Programs and Policy

217 Water Street, Suite 300, New York, NY 10038
T 212.935.9831 x107
waterfrontalliance.org
#OurWaterfront

WATERFRONT ALLIANCE

217 Water Street
Suite 300
New York, NY 10038

Tel: 212.935.9831
waterfrontalliance.org

July 16, 2018

Mr. Daniel Green
General Counsel and Certifying Officer
New York State Governor's Office of Storm Recovery
25 Beaver Street, 5th Floor
New York, NY 10004

Re: Comments on Living Breakwaters Final Environmental Impact Statement (FEIS)

Dear Mr. Green,

On behalf of the Waterfront Alliance, I am writing in support of the Living Breakwaters Project, to reduce flood risk along Tottenville's shoreline, with new coastal defenses within Conference House Park, and increased access to the waterfront for Staten Islanders. The Living Breakwaters project was designed as an innovative approach to coastal resiliency and New York State should advance the project to final design and construction, leading the way for these types of projects to be built across our region.

As the project proceeds toward implementation, it is important to ensure that habitat lost or converted is adequately mitigated in accordance with the damage. Given the significance of this project and its position as a precedent, it is important that a program and funds remain allocated for monitoring the project's habitat quality and its effectiveness in achieving proposed goals over time.

We urge the Governor's Office of Storm Recovery to strongly pursue identifying funds to monitor this important project's progress over time.

Thank you for your review and attention to this matter. If you have any questions about this letter, please feel free to call me at (212) 935-9831.

Sincerely,

Roland Lewis
President and CEO

Lentz, Amy (STORMRECOVERY)

From: Amoroso Debra <DAmoroso2@schools.nyc.gov>
Sent: Saturday, July 07, 2018 5:05 PM
To: nyshcr.sm.nyscdbg.dr.er
Cc: Kaplan, Lisa (STORMRECOVERY)
Subject: FEIS - Living Brakwaters and Dune Project - Yes to Alternative 2!!!

To Whom It May Concern;

I am writing in response to FEIS on the Living Breakwaters and Tottenville Shoreline Protection Project. I am in total support of Alternative 2 listed in Chapter 19. Alternative 2 includes the Living Breakwaters Reef System, the Waterhub and the Tottenville Shoreline Protection Project. These projects offer Tottenville a connected community to the waterfront, an opportunity to educate children about the marine ecosystem and provide protection to our fragile shoreline. I am in absolute support of this layered strategy.

Tottenville residents have always wanted a place to go by the waterfront to walk, to jog, and to bike ride. Since Superstorm Sandy, the residents have lost this ability. The proposed earthen berm and hybrid dune/revetment system trails would provide all Tottenville residents an opportunity to connect with the waterfront and have a place to enjoy walking by the waters edge. This opportunity should not be limited to the people who own property by the Conference House Park, the park should be accesible to all Tottenville residents. It is a shame how a few of the home owners that have access to the park through their backyards are trying to stop this project. This project as stated in the FEIS does not aversely impact the quiet, residential nature of the community. This project's fate should not be determined by a few homeowners, it should be determined by what is for the good of the community as a whole, not just for a few. This dune/revetment system is a win-win project. It provides the Tottenville Commuity a place to connect to the water/beach and it provdes protection against rising waters and storm surges. Wasn't it enough that we lost two lives during Sandy? How could we not want to prevent that from ever happening again?

The Living Breakwaters and Water Hub are essential to the ecosystem and our educational future. The Living Breakwaters allows us to lessen erosion/wave action and put back organisms into our ecosystem that have been gone. There are only benefits from installing the Living Breakwaters. There is no argument not to install them. The Water Hub allows educators to bring students to learn about ecosystems and the restoration of them. There is no greater lesson then a student being able to connect what they learned in a classroom and experiencing it for themselves. This is an educators dream, bringing students to the waterfront to "do science" is invaluable. The push for students to be exposed to real life science learning has never been greater. As a community how do we not support our future scientists? To inspire young students to care and make connections about their community and the natural world is vital for our future.

I am a lifelong educator and resident of Tottenville. I do not speak for my benefit, I speak for the benefit of the **entire Tottenville Community**. Please choose Alternative 2 for the Living Breakwaters and Tottenville Shoreline Project, Tottenville needs this project for a better community and a better future.

Thank you for your time,
Debra Amoroso

Mrs. Amoroso
8th Grade Science Teacher
Myra S. Barnes Intermediate School 24

***C*heck out my classroom projects! www.donorschoose.org/mrs.amoroso**

"Think and wonder, wonder and think." Dr. Seuss

Lentz, Amy (STORMRECOVERY)

From: leslie brown <lesliecbrown100@gmail.com>
Sent: Tuesday, July 03, 2018 10:41 AM
To: nyshcr.sm.nyscdbg.dr.er
Subject: approval of living breakwaters project

As an individual that experienced the impact of Hurricane Sandy first hand on the shores of Staten Island, I urge you to approve the Living Breakwaters project. Staten Island's coastal resources are a valuable and integral part of our island community. I believe this project will support the continued wellbeing of Staten Island's coastal communities, and wholeheartedly support the Rebuild by Design Living Breakwaters Project.

The planned project proposed an exceptionally innovative and habitat friendly approach to reduce flood risk along Tottenville's shoreline. Our communities will benefit from new coastal defenses within Conference House Park as well as essential ongoing access to the waterfront. Over time, with this more creative approach, the breakwaters will naturally grow to limit erosion and build back our beaches, enhancing the park and improving the quality of life for all of Staten Island who can access and use these resources.

The Living Breakwaters project holds out the promise of being one of the most innovative solutions to what had been a disaster for Staten Island. I hope that New York State will move quickly to advance the project to final design and construction, leading the way for these types of projects to be built across our region.

Sincerely, Leslie Brown

Lentz, Amy (STORMRECOVERY)

From: Thomas Bruno <tombruno@verizon.net>
Sent: Monday, July 16, 2018 1:46 PM
To: nyshcr.sm.nyscdbg.dr.er
Subject: Rebuild by Design Living Breakwaters Project

I write in support of the Rebuild by Design Living Breakwaters Project. As an individual committed to enhancing the quality of life in Staten Island, I urge the Governor's Office of Storm Recovery to proceed to final design and construction of its plan for breakwaters and treatments along the shoreline to reduce wave action, erosion and coastal flooding of the shoreline at Tottenville. The Governor's Office of Storm Recovery has diligently and thoroughly designed the project to increase marine habitat while maximizing the systems function to reduce storm risk, and to generate public understanding of the ecology of the estuary at the junction of the Lower New York Harbor and Raritan Bay. I look forward to the completion of this project.

Lentz, Amy (STORMRECOVERY)

From: Scott F Cerullo <scott.f.cerullo@verizon.net>
Sent: Monday, July 16, 2018 4:19 PM
To: nyshcr.sm.nyscdbg.dr.er
Subject: Rebuild by Design Living Breakwaters Project

As an individual and a life long resident interested in the continued wellbeing of Staten Island's coastal communities, I wholeheartedly support the Rebuild by Design Living Breakwaters Project.

The planned project will reduce flood risk along Tottenville's shoreline, while provided new habitat and exciting opportunities for fishing. Along the shoreline, the community will benefit from new coastal defenses within Conference House Park as well as access to the waterfront. Over time, the breakwaters will limit erosion and build back our beaches, enhancing the park and improving the quality of life for the residents that live here. The Living Breakwaters project was designed as an innovative approach to coastal resiliency and New York State should advance the project to final design and construction, leading the way for these types of projects to be built across our region.

Sincerely,
Scott Cerullo
Annadale, Staten Island

Sent from my iPhone

Begin forwarded message:

From: Patricia Crispi <panncrispi@gmail.com>
Date: June 27, 2018 at 2:24:13 PM EDT
To: Lisa.Kaplane@stormrecovery.ny.gov
Subject: Fwd: Tottenville Shoreline Project

Sent from my iPad

Begin forwarded message:

From: Patricia Crispi <panncrispi@gmail.com>
Date: June 27, 2018 at 10:55:02 AM EDT
To: Melanie.b.tymes@uscace.army.mil
Subject: Tottenville Shoreline Project

I am a Tottenville resident who lives right on the shoreline and am against the project you are proposing. This project will not prevent flooding every time there is a heavy rain the street fills up with water and it comes up my driveway and into my home. This project will not fix the situation with the outfalls that are constantly being clogged with sand so the water can not go out. We had enough with Sandy!!! Also A public pathway next to my home will affect my safety and the safety of this community. Every meeting from the beginning you told us you would listen to our concerns and do nothing without the communities approval. Now you approve the project that would be a disaster to everyone living here. You didn't listen to anything the community had to say. None of you people Live here so it's easy to approve something that doesn't affect you. Put yourself in our situation!! It's going on 6 year's of your studies and we're in the same boat as when Sandy hit us in Oct. 2012. Everyone down here has had it!!!
I want you to forward this email to GOSR.

Thank You,
Patricia Crispi

Sent from my iPad

Lentz, Amy (STORMRECOVERY)

From: falcostt5@verizon.net
Sent: Monday, July 16, 2018 9:09 AM
To: nyshcr.sm.nyscdbg.dr.er

"I strongly support the Living Breakwaters/Tottenville Shoreline Protection Project. I am a Staten island resident living within a block of the shoreline. My husband, son and two daughters and I had to run for our lives and evacuate our home on the night of Superstorm Sandy. The first floor if our home was flooded and many of our personal belongings destroyed. This plan wisely takes steps to safeguard the community and improve our use and enjoyment of our nearby parks. Please proceed with the project as quickly as possible." Kathleen Falco

Lentz, Amy (STORMRECOVERY)

From: E G <ethelgiordano@gmail.com>
Sent: Wednesday, June 13, 2018 12:29 PM
To: nyshcr.sm.nyscdbg.dr.er
Subject: Tottenville Project

Dear Sirs:
Thank you for the continued updates regarding this project. As a resident of the town of Tottenville, I have noticed that the sand dunes (Sprague St and points south) have experienced substantial erosion over the past few years. There has been no attempt to correct/replenish the diminishing sand. Shouldn't this be considered part of this project in effort to prevent similar problems to SANDY?

Sincerely,
E.Giordano

From: gallant4life@aol.com [mailto:gallant4life@aol.com]
Sent: Tuesday, June 19, 2018 10:38 AM
To: Kaplan, Lisa (STORMRECOVERY) <Lisa.Kaplan@stormrecovery.ny.gov>
Cc: annette.baden@aol.com
Subject: Re: Trip to Canada

To Lisa Kaplan

Let me get this straight, you are telling me 7 people made four separate round trips to Canada for a total of 14 days lodging, 42 meals , snacks, and beverages, travel to and fro the testing facility, use of a Wave tank testing facility on four occasions and the entire bill was 9,997.41 ?

Please produce the bills for these expenses.

Who by name went on this trip, what was their assignment and position for this work and what was the end results ?

The truth is that those wave tank tests have no actual reality, findings, or help understanding the complex hydrology of the Raritan Bay, it's ecosystems, marine life, pollution, currents, ebb tides, weather, shipping, pleasure boating and activity, if you did understand those things you would not be doing this wasteful, unneeded, unwanted, unwarranted, project to begin with.

Kind regards Michael Greco

From: gallant4life@aol.com [mailto:gallant4life@aol.com]
Sent: Wednesday, June 20, 2018 9:57 AM
To: Kaplan, Lisa (STORMRECOVERY) <Lisa.Kaplan@stormrecovery.ny.gov>
Cc: melanie.b.tymes@usace.army.mil; castorinar@nyassembly.gov; lanza@nysenate.gov; joddo@statenis.usa.gov
Subject: Time to answer questions Lisa - you have been stalling for years now.

To Lisa Kaplan

At this point, with your final EIS documents in, we demand to have our questions answered in writing as promised. No one has the time to go through thousands of pages of convoluted nonsense that has no real needs, wants, or desires, of the community. After many days I still cannot find the answers to our questions in your EIS and I did the most researching.

The grant given by HUD was for Sandy Damaged area's and repair , your projects DO NOT REPAIR THE AREA's DAMAGED or deal with the shore line issues here in Tottenville.
The break waters will do nothing to prevent a Sandy Type tidal surge, we have oysters in their proper proportions in the marine world, and the pathway will only bring violent crime to the back doors of my friends and neighbors.
You are simply tax money stealing opportunists that profit from other people catastrophes. You are a despicable bunch at best.

You people have wasted almost 6 years of playing design team oblivious, and should resign. Stop stealing our tax money with this nonsense, fabrications, lies and deceit.

My fathers generation from pencil to completion built the Varranzano Bridge, you people still can't figure out why city sized islands in the narrowest busiest part in the middle of the Raritan that leads into 110 degree turn up the Authur Kill could be a hazard with marine traffic carrying millions of gallons of fuel and oil. You have the minds of spoiled children with no concept of reality, care or concern for our ecosystems and environments. Just PROFIT for you and Israel.

Also after reading through most of the materials 1) I have not seen testing for Glyphosate ? 2) Did they test for this ? 3) It has been sprayed in the parks for the past 15 years that I know of, and has leached into the beach and Raritan Bay.
4) I cannot find anything about the lighting, 5) How many lights 6) The power source, 7) Out put in Lux or luminous emittence, 8) Total Lumens of all lights , 9) Range of illumination, 10) Spread of illumination, 11) Elevation of mounts ?
Now for the most serious of all concerns many of the Tottenville Residents Group are very distraught, I am deeply concerned about their mental and physical health, two of the members have been diagnosed with Leukemia. Everything they loved about being here is going to be destroyed if you and the other agencies allow this madness to continue.

I myself may not purchase the home of my dreams any more after seeing how the beautiful natural setting of this area will be filled with Polypropylene and Concrete which will further complicate things with negative results. Turning a blind eye to facts and reality for the sake of profit, greed, and ignorance is the lowest form of humanity.

Michael Greco

Environmentalist , Activist , Naturalist

Tottenville Residents Spokes Person

"The only thing needed for evil to exist , is for good men to do nothing" Edmond Burke

Also in response to your response and I wish to be clear about this.

Let me get this straight, you are telling me 7 people made four separate round trips to Canada
for a total of 14 days lodging, 42 meals, snacks, and beverages, and travel.

Use of a Wave tank testing facility on four occasions and the entire bill was 9,997.41 ???

Beside the fact that those wave tank tests have no actual reality to the complex hydrology of the Raritan Bay, it's ecosystems , it's currents, ebb tides, weather, shipping, pleasure boating and activity.

Who by name, assignment, and position, from the design staff went on this trip ?

Kind regards Michael Greco

==========

From: gallant4life@aol.com [mailto:gallant4life@aol.com]
Sent: Thursday, June 21, 2018 9:14 AM
To: Kaplan, Lisa (STORMRECOVERY) <Lisa.Kaplan@stormrecovery.ny.gov>
Cc: melanie.b.tymes@usace.army.mil; [redacted] borelli@council.nyc.gov; castorinar@nyassembly.gov; joddo@statenisland.usa.com; lanza@nysenate.gov
Subject: Your EIS does not contain the MSDS sheets of Materials for projects

To Lisa Kaplan

Please provide the MSDS for any and all products, chemicals ,building materials planned for these projects.
Please start with the MSDS for the concrete from Israel AKA Armored Toe Units,
and the Polypropylene AKA Geo textile and all others promptly.

Regards Michael Greco

From: gallant4life@aol.com [mailto:gallant4life@aol.com]
Sent: Wednesday, July 04, 2018 9:46 AM
To: anthonyreinhart@gamil.com; Kaplan, Lisa (STORMRECOVERY) <Lisa.Kaplan@stormrecovery.ny.gov>; [redacted]
Cc: melanie.b.tymes@usace.army.mil; james.h.cannon@usace.army.mil; foia-nan@usace.army.mil; stormrecovery.sm.gosr.foil <gosr_foil@stormrecovery.ny.gov>; castorinar@nyassembly.gov; borelli@council.nyc.gov; lanza@nysenate.gov; joddo@statenisland.usa.com; joddo@statenislandusa.com
Subject:

Good morning all,

You are receiving this E-mail to be made aware of the real facts and not the fallacies perpetuated by Governors Office of Storm Recovery AKA GOSR from Beaver Street.

The Living Break Water Projects planned for Tottenville are an aberrant misappropriation of tax payer money. Conceived by deceitful people that are

profit driven, self centered, and dis concerned with anything but themselves. What they are planning to do is NOT for the greater good of Staten Island or the Raritan Bay our environment and ecosystems.

The reasons for this project according to Governors Office of Storm Recovery or GOSR at Beaver street is :

1) THEIR REASON - Attenuate Waves:

Our Response and Facts : This is the calmest, part of the whole Raritan Bay and of all NYC beaches, your own wave analysis data confirms that, and to further substantiate our claim a recent article in the Wall Street Journal.
The New York City Beach That Doesn't Make Waves - WSJ
The negative effects of these islands, finger reefs, locations, designs, size, and materials are deadly, hazardous, dangerous and ill conceived , the details are pages long and have been well documented and shared.

2) THEIR REASON - To Have Oysters

Our Response and FACTS: We already have oysters in their proper proportions and balance with other marine species. We do not need 70 million dollars worth of concrete and polypropylene to have oysters. Tottenville was once an oyster mecca. If we want or need more oysters all we need to do is reduce pollution and not over harvest them.

Also if this is anything like the million tree project where most of the trees ended up dead , planted in clay, already dead when planted, or planted in the wrong place or species for the environment where they were put, we suggest you get different people for this billion oyster project, maybe people that really care this time.

3) THEIR REASON - To Stop Erosion:

Our Response and FACTS : One super storm took some sand away in some area's and pushed it inland in others, we simply need to replenish it where it was taken away and build short groin jetty's to keep it. The real cause of erosion on many of the beaches here is from the Storm line outfalls that are to short, and wash out the beaches with every heavy rain fall. Then there are area's that get sand accretion from the Southern winds that push sand back up on the beach, this will not happen if the islands are built. Beach's around the world replenish sand, Concrete and Polypropylene islands are not the answer and will destroy this picturesque natural beautiful area of the Raritan Bay and shore line.

WHAT IS YOUR JUSTIFICATION FOR THIS PROJECT ?

Summation : These projects will do damage to the environment and ecosystems, destroy wetlands and forever wild area's as well as real estate value. They will be maritime and pleasure craft nightmares taking life and property because of the location selected. They greatly jeopardize people's safety and well being. They were conceived by profit driven people without any real concern, concept of nature, for the people that live here, or the lay of the land.

Super Storm Sandy took lives here and did severe damage along the area in question as it did in hundreds of neighborhoods along the Eastern seaboard, why did they pick this spot for their experimental project ? I'll tell you why, they thought they would easily get over on the people that reside here , they were greatly mistaken, because we will fight this for how ever long and costly it is till good sound reason prevails !
GOSR tried to use that as a ruse to get the residents to believe in it.
Remember that old saying "Never let a good crisis go to waste." well, they are implementing it here.
Since then, the ruse has been uncovered and exposed that these islands will do nothing to prevent another Sandy type tidal surge and flood. (ONE OF MANY MASSIVE GIANT LIES THEY WERE CAUGHT IN).

You cannot protect the shore line from the water if there is a tidal surge, the water simply goes around obstacles or islands.
The shore line has to be protected at the shore line with # 4 and 5 Rip Rap and build up of the beach sand, we are asking for 4 foot which will provide a 60 foot beach, which in turn will also be good for the public to have access and ease of way from the Conference House Park to Page Ave and beyond if you acknowledge our plan and design.

[redacted]

Lisa Bova Hyatt the Directer of the whole GOSR is also not part of this project any more and the Governors office refuses to tell us why.
She now works for a company that specializes in Oil spills, Does she know something we don't ? This is our **number one concern, a hull breech and oil spill.**
Are these people pre planning an environmental disaster ?
After receiving a death threat, and with the attempt to start a fire storm that would have burnt down a good portion of Tottenville and all the shore front homes for government take over, I would put nothing past these people.

Danial Greene the lead attorney made it publicly known they he did not known there was concrete in this project at meeting 6, after working for years on this project while collecting a six figure salary, and he is their environmental expert ?

Lisa Kaplan current project manager tried to prevent us from bringing in our visuals to meeting 8 so the public attending could not see the truth, she was rude , nasty, and condescending, along with Danial Greene who started shouting insults and also tried to block us until we told him we also has legal representation coming.

[redacted]

WHERE DO THEY GET THESE PEOPLE FROM ?
My ears cry, when I hear them speak. (That is a metaphor for the unknowing of an expression)

The HUD money was supposed to be used for Sandy Storm relief and repair of damaged area's. The GOSR is nothing more than over glorified fantasy for profit project and does nothing to serve the broken and damaged infrastructure, shore line, garbage and debris that plaque this area after the Sandy Storm. **This really is a case of misuse, misappropriated, misallocated, and misdirected tax money some of it has already gone to two foreign countries that we know of, along with several different states** and then the bulk of it into the pockets of people using a catastrophe to profit from, then there is a whole staff at beaver street of which they will on;y partially disclose how many getting paid for almost 6 years on a project that will destroy one of the nicest natural area's in Staten Island and ruin peoples lives in the process. **We really are dealing with profit driven sociopaths !**

THIS IS WHY OUR TAXES ARE SUPER HIGH !!!

Our Tax money is going everywhere except where it is needed, rather than on the Tottenville shoreline and storm drain infrastructure up grade to stop the reoccurring home flooding. The residents and they have already suffered mentally and physically from years of anguish and hardship brought upon them from having there homes and lives disrupted first by Sandy and now by a profit driven project that is unneeded, unwanted, and unwarranted. We have extended every form of reason we can think of, extended the olive branch on many occasions. It was meet with lies, deceit, denial, deception, disrespect, disregard and skulduggery.

If the permit for this insane, profit driven project, is some how granted WE THE PEOPLE will file a, cause of harm law suit / injunction, followed by another law suit to recoup our expenditures of which some of you (any and all backing this project) will be listed as defendants. This will be done in what ever court that can hold the State of NY as well as everyone involved accountable. We are also discussed an investigation by the Attorney General but are holding off until we hear from our Governor and the rest of you.

Never the less we are still open to reasonable, intelligent, negotiations for anyone left that really cares to make this a project of progress and not a project for profit . With 1/10 that money that is being squandered and misused we can transform this entire shore line into a world class beach, recreation, natural marine and wildlife habitat area, while solving and upgrading the storm drain issues. flooding, and erosion. Now you can all save face by working with us but some advise, think long and hard about this, you may think you're untouchable and can do as you wish . Do not underestimate our resolve, connections, resources, and financial backing. Better to work with us, than be crapping in your pants while sitting on the stand with over whelming irrefutable evidence and multiple witness testimony against you .

1) You cannot debate the TRUTH no matter how much you lie or fabricate.
2) People like you are trying hard to destroy our country, but there are still many Americans that care and will stand in your way from doing so.
3) We The People and our Constitution are still in charge here.

We expect a reply here with in one week by Friday July Friday the 13 2018 whether we all sit down and talk like rational and fair minded Americans, or litigate, we will leave that up to you.

Sincerely The Tottenville Residents Group
Spokes Person
Michael Greco 646 423 3571

From: gallant4life@aol.com [mailto:gallant4life@aol.com]
Sent: Friday, July 06, 2018 7:17 PM
To: Kaplan, Lisa (STORMRECOVERY) <Lisa.Kaplan@stormrecovery.ny.gov>; Feeney, Thomas (CHAMBER) <thomas.feeney@exec.ny.gov>; [redacted] melanie.b.tymes@usace.army.mil
Cc: castorinar@nyassembly.gov; lanza@nysenate.gov; joddo@statenis.usa.gov
Subject: More questions, try to actually answer some, this time.

To Lisa Kaplan and company

I see you people drew dotted red lines on your cover poster from Lemon Creek Marina and past that point coming to the concrete and Polypropylene islands and finger reefs protruding out on the channel side.

Are you planning on actually having docks on these islands and finger reefs ?

Your scale is way off on the distances from the channel to the proposed locations of the islands and sail boats have keels and would run a ground where you show them in the shallows.

I just have to tell you none of us fall for the fake drawings, fake literature, or fake narration of said project.

What kind of people are you for Gods sake ? Were you raised in prisons by pirates ? or are you environmental terrorists posing as designers ? It is beyond my thought process why anyone would do such a careless, reckless , irresponsible, inconceivable, project in this location unless they were planning a disaster.

Who in there right mind would put Concrete and Polypropylene islands, or even worse permit this, in the busiest intersection on the Raritan Bay going into a 110 degree turn into the Arthur Kill where we have in the order of 16 fuel laden ships and tug pushed barges a day along with other commercial marine commerce mixed in with many pleasure craft of varying sizes that will have a blind sided field of view for close to two miles.

The fog here gets so dense here you cannot see your hand in front of you and those finger reefs on the channel side, that is really the cremdalacam of ignorance and stupidity, they will have ships and boats of all sizes piled up on them, do you people have stock in Sea Tow and oil spill clean up companies ? Yes that is a real serious question.

The reason I ask that is, I understand that is where the Directer for GOSR Lisa Bova Hyatt is now working for, an oil and environmental disaster clean up company called https://www.wittobriens.com/ go ahead check it out , but you already know that, don't you .

I guess her position with land repossession did not work out when the fire storm you people attempted did not work out so well, now an oil spill disaster on your concrete islands and jetties wow there is no shortage of evil with you people is there ?

I am sure people with your treachery can think of other ways to steal our tax money with out burning down neighborhoods, killing innocent men, woman, and children, and creating environmental disasters for the heavy price/profit to clean them up.

You would think you would be happy with almost 6 years of salary playing with your crayons up in your secret office with triple manned security that the public can not see. What are you hiding the charts on projected oil spill profit for the next ten years ?

If they had awards for projects of stupidity, tax theft, and environmental destruction, you would win all three and I would vote for you.

Looking forward to the next CAC meeting , we have some interesting guests appearing that are most interested in your projects and expenditures , just thought I would let you know about that.

Have a nice day
Kind Regards Michael Greco
Environmentalist, activist, naturalist.

"The Only thing needed for evil to exist is for good men to do nothing " Edmond Burke

From: gallant4life@aol.com [mailto:gallant4life@aol.com]
Sent: Tuesday, July 10, 2018 8:05 AM
To: Kaplan, Lisa (STORMRECOVERY) <Lisa.Kaplan@stormrecovery.ny.gov>
Subject: Fwd: More concerns about GOSR

To Lisa Kaplan we want answers to these questions

From: gallant4life@aol.com
To: melanie.b.tymes@usace.army.mil, castorinar@nyassembly.gov, lanza@nysenate.gov, joddo@statenisland.usa.com
Sent: 6/14/2018 8:30:16 PM Eastern Standard Time
Subject: More concerns about GOSR

Hello Melanie

After reading through most of the materials 1) I have not seen testing for Glyphosate ? 2) Did they test for this ? 3) It has been sprayed in the parks for the past 15 years that I know of, and has leached into the beach and Raritan Bay.
4) I cannot find anything about the lighting, 5) How many lights 6) The power source, 7) Out put in Lux or luminous emittence, 8) Total Lumens of all lights , 9) Range of illumination, 10) Spread of illumination, 11) Elevation of mounts ?
Now for the most serious of all concerns many of the Tottenville Residents Group are very distraught, I am deeply concerned about their mental and physical health, two of the members have been diagnosed with Leukemia. Everything they loved about being here is going to be destroyed if you and the other agencies allow this madness to continue.

I myself may not purchase the home of my dreams any more after seeing how the beautiful natural setting of this area will be filled with Polypropylene and Concrete which will further complicate things negatively with a domino effect which I have written in detail to all of you about. Turning a blind eye to facts and reality for the sake of profit, greed, and ignorance.

Michael Greco

Environmentalist , Activist , Naturalist

Tottenville Residents Spokes Person

"The only thing needed for evil to exist , is for good men to do nothing" Edmond Burke

Kaplan, Lisa (STORMRECOVERY)

From: gallant4life@aol.com
Sent: Wednesday, July 11, 2018 4:39 AM
To: lanza@nysenate.gov; castorinar@nyassembly.gov; joddo@statenislandusa.com; borelli@council.nyc.gov; Kaplan, Lisa (STORMRECOVERY); joseph.homsey@parks.nyc.gov; Feeney, Thomas (CHAMBER); melanie.b.tymes@usace.army.mil
Subject: Please take note and please be present at the upcoming CAC meeting July 18 2018

We do not want or need 70 million dollars worth of Concrete and Polypropylene, with contracts for the foreign country of Israel, and several other States, to have oysters here on Staten Island where they already exist, but here is what is really needed for 1 /10 the cost . To the Tottenville Residents Group, let's see what our elected officials do, they have all been asked to be present themselves, at the up coming CAC meeting at the CYO at Mount Loretto on July 18 2018 at 7 PM. They need to be brought up to speed on how WRONG, WASTEFUL, AND DANGEROUS THIS PROJECT IS FOR STATEN ISLAND.

The People's Plan, let me know if this covers the communities needs, wants, desires, and aspirations. It is a compilation of two years talks, research, and studies. It also provides a place for the oysters, a beach for egress, all the shore front protection we need, anti flooding methods and infrastructure. A sound cleaning of the entire area and shallow bay with nature marine and wildlife habitats for all living creatures.

1) Remove all the derelict spiked pilings, docks, piers, structures, concrete, boulders, construction debris, old infrastructure, and garbage, on the beach and in the shallows. All these things are an extreme hazard to walkers, hikers, runners, swimmers, fishermen, kayakers, water skiers, jet skiers, boaters, wildlife and marine life. As well as anything else that may take place on the beach or in the water.

2) Re-purpose all the natural rocks and boulders for(*1 Shore Line Rip Rap - will protect the area from storm surges and erosion. (*2 Short Groin Jetties - with reflective poles at the ends, this will prevent beach erosion) and (*3 Natural Reefs - can be put in a number of places along the shore line where there are higher bluffs with no homes, no views obstructed, and not in busy commercial or recreational use area's, this will also create a natural marine habitat for oysters and many other ecosystems and marine life. Also alleviates commercial maritime proximity and our number one concern a envorormental disaster from a oil tanker or barge hull breech. Stone sizes, placement, amounts, and location, to be determined my marine engineer, with input by locals that know the lay of the land.

3) Storm line infrastructure to be repaired, especially where flooding occurs during heavy rain. Install pump stations where necessary in lower elevations. Outfalls transitioned, extended, check valved, secured and buried. (*4 This will also help prevent erosion and prevent flooding.)

4) Beach raised and extended, elevation and length to be determined by marine engineer with input from locals that know the lay of the land. We are looking for 4 foot elevation and 60 of beach added (*5 This will provide a means of egress along the shore line for as long as the beach is continued for public use thus removing the controversial and dangerous public pathway mere feet from home owners bedroom windows also for park maintenance the use of gators, NOT heavy trucks that have enviromental, ecosystem and quailty of life issues)

5) Conservancy -Wooded area's to be cleaned up of the mass amounts of dead forestry from salt water flooding and storm damage. It is a fire hazard to have that much dead dried out twigs, branches, and trucks. Also remove anything unnatural, derelict structures or buildings, infrastructure, refuse, debris and garbage. This will provide a healthy, clean, and safe habitat for all living creatures.

6) Remove what Parks to be considered evasive species WITHOUT CHEMICALS OF ANY SORT, NO MORE ROUND UP, ACCORD, OR CANCER CAUSING GLYPHOSATE. Goats, tools, machines, or manual labor only.

7) Habitats area's for insects, animals, birds and marine life preserved.

8) Reduce water pollution from any source it is derived from. Educate and help with grants if necessary for people that conduct business on the water that may have to make changes to their business to stop water pollution.

From: gallant4life@aol.com [mailto:gallant4life@aol.com]
Sent: Monday, July 16, 2018 7:36 AM
To: Kaplan, Lisa (STORMRECOVERY) <Lisa.Kaplan@stormrecovery.ny.gov>; melanie.b.tymes@usace.army.mil; castorinar@nyassembly.gov; borelli@council.nyc.gov; lanza@nysenate.gov; joddo@statenisland.usa.com; [redacted] nicolas.perry@exec.ny.gov; james.h.cannon@usace.army.mil; danialgreene@stormrecovery.ny.gov; Feeney, Thomas (CHAMBER) <thomas.feeney@exec.ny.gov>
Subject: Letter to the Gov

Dear Gov. Cuomo,
We propose the following project in negotiation to the current project that is just unacceptable. We are truly and sincerely looking for a compromise in lieu of litigation to the current project.
We worked on this alternative project which gives everyone what they set out to do, which is the 1) Billion Oyster Project, 2) Means of egress from Conference House Park to Page Ave, 3) Water Hub Education Center. 4) Bonus revitalized natural habitats for wildlife and marine species, much expanded and safer recreation area's for the people, infrastructure repaired to stop flooding during rain storms. Shore line protection and erosion issues resolved.
We do not want or need 70 million dollars worth of Concrete and Polypropylene, with contracts for the foreign country of Israel, and several other States, to have oysters here on Staten Island where they already exist in their proper proportions with other marine life. Here's what is really needed.
The People's Plan is a compilation of two years talks, research, and studies. It also provides a place for the oysters, a beach for egress, all the shore front protection we need, anti flooding methods and infrastructure. A sound cleaning of the entire area and shallow bay with nature marine and wildlife habitats for all living creatures.
1) Remove all the derelict spiked pilings, docks, piers, structures, concrete, boulders, construction debris, old infrastructure, and garbage, on the beach and in the shallows. All these things are an extreme hazard to walkers, hikers, runners, swimmers, fishermen, kayakers, water skiers, jet skiers, boaters, wildlife and marine life. As well as anything else that may take place on the beach or in the water.
2) Re-purpose all the natural rocks and boulders for(*1 Shore Line Rip Rap - will protect the area from storm surges and erosion. (*2 Short Groin Jetties - with reflective poles at the ends, this will prevent beach erosion) and (*3 Natural Reefs - can be put in a number of places along the shore line where there are higher bluffs with no homes, no views obstructed, and not in busy commercial or recreational use area's, this will also create a natural marine habitat for oysters and many other ecosystems and marine life. Also alleviates commercial maritime proximity and our number one concern a envorormental disaster from a oil tanker or barge hull breech. Stone sizes, placement, amounts, and location, to be determined my marine engineer, with input by locals that know the lay of the land.
3) Storm line infrastructure to be repaired, especially where flooding occurs during heavy rain. Install pump stations where necessary in lower elevations. Outfalls transitioned, extended, check valved, secured and buried. (*4 This will also help prevent erosion and prevent flooding.)
4) Beach raised and extended, elevation and length to be determined by marine engineer with input from locals that know the lay of the land. We are looking for 4 foot elevation and 60 of beach added (*5 This will provide a means of egress along the shore line for as long as the beach is continued for public use thus removing the controversial and dangerous public pathway mere feet from home owners bedroom windows also for park maintenance the use of gators, NOT heavy trucks that have environmental, ecosystem and quality of life issues
5) Conservancy -Wooded area's to be cleaned up of the mass amounts of dead forestry from salt water flooding and storm damage. It is a fire hazard to have that much dead dried out twigs, branches, and trunks. Also remove anything unnatural, derelict structures or buildings, infrastructure, refuse, debris and garbage. This will provide a healthy, clean, and safe habitat for all living creatures.

6) Remove what Parks to be considered evasive species WITHOUT CHEMICALS OF ANY SORT, NO MORE ROUND UP, ACCORD, OR CANCER CAUSING GLYPHOSATE. Goats, tools, machines, or manual labor only.
7) Habitat area's for insects, animals, birds and marine life preserved.
8) Reduce water pollution from any source it is derived from. Educate and help with grants if necessary for people that conduct business on the water that may have to make changes to their business to stop water pollution.
9) Water Hub relocated from the original position next to residential homes to a more convenient and use full area. The end of your proposed 7 mile board walk that would put it at the end on Oak beach just outside the Great Kills Marina. This location would get 1000 times the use and productivity compared to the nestled hidden location with very few people attending.
If you could please be present at the up coming CAC meeting at the CYO at Mount Loretto on July 18 2018 at 7 PM. Governor you need to be brought up to speed on how WRONG, WASTEFUL, AND DANGEROUS THIS PROJECT IS FOR STATEN ISLAND.
Kind regards Michael Greco
Spokes Person for the Tottenville Residents Group

Lentz, Amy (STORMRECOVERY)

From: kerrygoody <kerrygoody@twc.com>
Sent: Saturday, June 23, 2018 9:15 PM
To: nyshcr.sm.nyscdbg.dr.er
Subject: Tottenville Shoreline protection

All the homeowners east of Sprague Avenue 2 Page Avenue do not want a pathway running through the backyards. There will be no buffer zone it's going to be a quality-of-life issue and you will only be taken away out of safety. 95% of the homeowners have seawalls and we didn't lose and inch property for over 20 years now. This money needs to go towards the biggest problem we have and that's the storm water out Falls. These out Falls are the major cause of the beach erosion why are you not investing this money to fix this problem. You need to spend the money west of Sprague Avenue where lives and homes were lost this area is 8 to 16 foot lower they need all the help. So stop wasting taxpayers money on a pathway east of Sprague Avenue which is on much higher grounds which is only going to destroy the neighborhood and has nothing to do at all with storm protection.

Sent from my MetroPCS 4G LTE Android Device

Lentz, Amy (STORMRECOVERY)

From: kerrygoody <kerrygoody@twc.com>
Sent: Sunday, June 24, 2018 2:14 PM
To: nyshcr.sm.nyscdbg.dr.er
Subject: Tottenville Shoreline protection/ Living breakwater project.

My name is Kerry Halvorsen I live on Joline Lane Staten Island.I have been a Tottenville resident my entire life.I am also a CAC member for this project.
This project will do nothing for storm protection. This is the calmest bay with no waves. The installation of the breakwaters will be disastrous for oil tankers and personal watercraft. This is a very narrow channel where we witness ourselves two ships run aground on the shore. This can cause a Exxon Valdez which would take years to clean, never mind the animals and plant life which will be effected. The pathway should not be installed behind hard working tax payers homes that are already on higher elevation. The protection we need is for the storm water outfalls to be extended and made into groin jetties akso replenish the sand between the jetties.This will give us protection and we will now have a beach once the sand is replenished. The outfalls is causing the beach erosion which is taking away our protection. The lower areas where lives and homes were lost is where the focus should be for protection. Who and where is the money coming from to maintain this project. We don't need a open pathway behind our homes 24 hours a day/7 days a week unpoliced.This is a very serious quality of life issue. We have young children, elderly and pets that we need to protect and don't strangers in our back yards. Nobody would want a pathway in their back yard only a few feet from their windows. I'm sure if you were in our shoes you would agree.
Is the governor aware you are preparing to destroy a neighborhood instead of fixing the problem the storm water outfalls.
Kerry Halvorsen

Lentz, Amy (STORMRECOVERY)

From: kerrygoody <kerrygoody@twc.com>
Sent: Sunday, June 24, 2018 2:45 PM
To: nyshcr.sm.nyscdbg.dr.er
Subject: Tottenville Shoreline protection

Why does the governor's office of storm protection has a project manager who has no idea about Shoreline protection. I'm the third generation living on this Shoreline the biggest problem or the storm water outfalls these out Falls keep washing away the shoreline which is taking away our protection. I sent them pictures and specs on how to fix these outfalls this is what other states are doing to give their communities Shoreline protection. Also the sand needs to be replenished on a shoreline
Every foot of sand will give you 15 ft of a Beach which will give us protection make the beaches beautiful so everyone can enjoy them. All the homeowners east of Sprague Avenue to Page Avenue or totally against the Millions that you're trying to waste on a pathway which is going to run right through the homeowners backyards. This pathway has nothing to do at all with storm protection it's only going to destroy the neighborhood. This pathway will only take away the quality of life and safety and be an invasion of privacy with no buffer zone. I'm just wondering if the government knows what's going on with this project you have over 90 million dollars to give us protection so let's use this money for protection instead of taking away our safety.

Sent from my MetroPCS 4G LTE Android Device the biggest problem

Lentz, Amy (STORMRECOVERY)

From: kerrygoody <kerrygoody@twc.com>
Sent: Saturday, June 30, 2018 8:44 PM
To: nyshcr.sm.nyscdbg.dr.er
Subject: Tottenville Shoreline protection

If you think you going to run that pathway from Sprague Avenue to Page Avenue throw the homeowners backyards to only take away our safety and quality of life with no buffer zone. We the Tottenville residence are willing to go all the way through the court systems to put a stop to this .I hope the governor of New York put a stop to this . Because we're going to prove that the state waste his millions of dollars and I'm sure it's not going to look good if he runs for president the United States.

Sent from my MetroPCS 4G LTE Android Device

Lentz, Amy (STORMRECOVERY)

From: joehartigan@aol.com
Sent: Monday, July 16, 2018 12:24 PM
To: nyshcr.sm.nyscdbg.dr.er
Subject: Staten Island living breakwater

I have two concerns about the proposed living breakwater that will be built off the Staten Island coast:

1. In most of your descriptions you show seals on the breakwater rocky structure. If you increase the habitat for seals, then you will increase food for its main predator -the Great White shark. Since the breakwater is close to shore, there should be concern that there could be shark increase contact with beach goes. In Cape Cod there has been no seal hunting, so the shark population has exploded 10 fold thus more great whites. Take a look at the video (below) of the Great White shark attack on a seal close to shore in Cape Cod. One solution may be a breakwater that is just below the surface at low tide similar to a sand bar on the ocean which causes the waves to break further from shore.

2. BEACH Erosion: If you build a breakwater parallel to the shore, the current will travel closer to shore and may increase beach erosion. The water traveling in the incoming and outgoing tides closer to shore on the shore side of the breakwater may move faster than on the shipping channel side because of the breakwater.

   The water traveling in the Hudson River Canyon travels closer to Staten Island than Brooklyn. The structures may increase beach erosion. Another side effect could be a strong under tow by the water rushing between the break water structures causing what is known as a Sea Puss. Seas Puss definition: a strong near shore current resulting from a seaward flow of water through a channel in the bar [breakwater]. The breakwater near Tottenville is near a shipping channel and deep water, so the openings in the breakwater could increase the under tow. One solution could be to angle the break water to the beach thus increasing the size of the opening.

In conclusion I hope you can address my two concerns. Staten Island deserves safe beach protection.

Joe Hartigan

1. Sea puss | Define Sea puss at Dictionary.com
   www.dictionary.com/browse/sea-puss
   Sea puss definition, a strong nearshore current resulting from the seaward flow of water, especially through a channel in a bar. See more.

2. sea puss - Wiktionary
   en.wiktionary.org/wiki/sea_puss
   The sea-puss is of variable width—from twenty or thirty feet to perhaps fifty or a hundred—and its location can generally be recognized by the peculiar roughness of the sea, […] as well as by the fact that the beach opposite to it is channeled by the action of the water.

1. Videos for Are There Great White Sharks In New York City?

o 

3:22

Are there great white sharks in New York City?
ABC News

o 

3:32

Are there great white sharks in New York City?
YouTube

o 

3:22

Video: Are there great white sharks in New York City?
go.com

o 

Are There Great White Sharks In New York City
VIDUBA

2. See more videos for Are There Great White Sharks In New York City?

3. Great White Sharks Return to New York Harbor - RealClearLife
www.realclearlife.com/science/great-white-sharks-return-new-york...
After centuries of pollution decimated marine life, a new Discovery Channel Shark Week special highlights the resurgence of sharks in New York City waters. This is no Sharknado movie. The return of great whites to New York City may give you even more reasons to visit the nearby beaches this summer. Not for the carnage, but for the marine life.

- Great White Shark Seal Attack in Cape Cod Caught On Camera
1 year ago
youtube.com

- 

1:04

Great White Sharks Close to Beach // Cape Cod, MA // 4K Drone Footage
10 months ago
youtube.com

-

Shark Attacks Seal Near Surfers Off Cape Cod

10 months ago

youtube.com

Lentz, Amy (STORMRECOVERY)

From: Merryl Kafka <goodfishdr@aol.com>
Sent: Friday, July 06, 2018 6:09 PM
To: nyshcr.sm.nyscdbg.dr.er
Cc: board@nysmea.org
Subject: Rebuild by Design Living Breakwaters Project

Dear NYSCDBG Staffers,

I am a marine science educator who has been teaching the general public, school students, teachers and families about the necessity of protecting, preserving and enhancing our coastal habitats and neighboring communities for 40 years.

As an individual and Executive Board Member of the New York State Marine Education Association (NYSMEA.org)

I support any efforts that will help sustain the well being of Staten Island's coastal communities. I wholeheartedly support the **Rebuild by Design Living Breakwaters Project.** The planned project will reduce flood risk along Tottenville's shoreline, while providing new habitat and exciting opportunities for fishing along the shoreline. Oyster reefs are keystone species that will help to encourage the settlement of other marine organisms, as well as buffer the threat of ocean acidification. The community will benefit from new coastal defenses within Conference House Park as well as access to the waterfront. Over time, the breakwaters will limit erosion and build back our beaches, enhancing the park and improving the quality of life for the residents that live here. The Living Breakwaters project was designed as an innovative approach to coastal resiliency and New York State should advance the project to final design and construction, leading the way for these types of projects to be built across our region.

Of course I do realize that living breakwaters, will have little effect or none at all on mitigating severe damage and flooding from major storms such as Hurricane Sandy, but these structures will help reduce small incremental natural erosion processes that occur slowly from season to season over time. The installation of oysters will also help to improve water quality along the shoreline.

Thank you for your review and consideration regarding this matter.

Remember..... Coastlines are our Lifelines

Respectfully submitted,

Dr. Merryl Kafka
Marine Science Educator
Executive Board Member/NYSMEA.org
917 838- 2647
Goodfishdr@aol.com

Lentz, Amy (STORMRECOVERY)

From: Cate Larsen <catelarsen95@gmail.com>
Sent: Monday, July 16, 2018 12:32 PM
To: nyshcr.sm.nyscdbg.dr.er
Subject: Rebuild by Design Living Breakwaters Project

To Whom It May Concern,

As an individual interested in the continued wellbeing of Staten Island's coastal communities, I wholeheartedly support the Rebuild by Design Living Breakwaters Project.

The planned project will reduce flood risk along Tottenville's shoreline, while provided new habitat and exciting opportunities for fishing. Along the shoreline, the community will benefit from new coastal defenses within Conference House Park as well as access to the waterfront. Over time, the breakwaters will limit erosion and build back our beaches, enhancing the park and improving the quality of life for the residents that live here. The Living Breakwaters project was designed as an innovative approach to coastal resiliency and New York State should advance the project to final design and construction, leading the way for these types of projects to be built across our region.

Best,
Caitlin

Lentz, Amy (STORMRECOVERY)

From: Martin Larsen <martinclarsen@gmail.com>
Sent: Monday, July 16, 2018 9:51 AM
To: nyshcr.sm.nyscdbg.dr.er
Subject: Rebuild by Design Living Breakwaters Project

As a resident of Staten Island, please consider the following in regards to the Rebuild by Design Living Breakwaters Project. This project offers exciting opportunities for other residents of Staten Island, as well as visitors to Tottenville, to learn first-hand about the diverse ecology of the the Tottenville shoreline that will experience reduced wave action and erosion after breakwaters are constructed offshore. Additionally, the project will be a model for students, public officials and professionals who want to learn about creative strategies for coastal resilience in a time and in an area increasingly affected by climate change. For these reasons, I avidly support approval of the project and look forward to its construction.

Sincerely,

Martin Larsen

Lentz, Amy (STORMRECOVERY)

From: Sarah Lipuma <lipumasarah@gmail.com>
Sent: Thursday, July 05, 2018 9:35 AM
To: nyshcr.sm.nyscdbg.dr.er
Subject: Rebuild by Design Living Breakwaters Project

I write in support of the Rebuild by Design Living Breakwaters Project. As an individual committed to enhancing the quality of life in Staten Island, I urge the Governor's Office of Storm Recovery to proceed to final design and construction of its plan for breakwaters and treatments along the shoreline to reduce wave action, erosion and coastal flooding of the shoreline at Tottenville.

Along the shoreline, the community will benefit from new coastal defenses within Conference House Park as well as access to the waterfront.

The Governor's Office of Storm Recovery has diligently and thoroughly designed the project to increase marine habitat while maximizing the systems function to reduce storm risk, and to generate public understanding of the ecology of the estuary at the junction of the Lower New York Harbor and Raritan Bay.

The Living Breakwaters project was designed as an innovative approach to coastal resiliency and New York State should advance the project to final design and construction, leading the way for these types of projects to be built across our region. I look forward to the completion of this project.

Sincerely,
Sarah Lipuma
Staten Island Resident

Lentz, Amy (STORMRECOVERY)

From: Michael Panarello <ant81465@gmail.com>
Sent: Sunday, June 24, 2018 1:06 PM
To: nyshcr.sm.nyscdbg.dr.er
Subject: Project concerns

Sent from my iPhone
my name is Michael Panarello and I have many concerns about the project first of all I live right on Joline lane and am concerned greatly for a pathway that will basically one in the backyard's of my neighbors and I which will cause privacy concerns as well as the possibility for vandalism and theft due to be easier access of people onto our properties. My next concern would be the stupid idea of a water hub at the end of page, which will generate much congestion and again invasion of privacy and our way of life over here nine to mention bringing down the value and the lock to our neighborhood. Perhaps my biggest concern would be the thoughtless idea of putting obstacles in a narrow bay that tends to have very little in the way of waves, Thus creating a more difficult water path for crafts to navigate ending to a major concern of accidents by old boat craft especially any tanker containing harsh chemicals and or oil. Any catastrophe like that will equal decades of problems, and ironically that kind of accident is far greater likely then the proposed Hazard of a super storm that this project claims it is trying to prevent however it was documented by the people the familiar with this project that storm surges can not be protected against. It is amazing that the powers that be do not concern themselves with the simplest solutions to the problems that everybody agrees exist which would be extend the outfall drains create natural rock jetty's and palm sand in between all of them and move this type of project to another area where it can be far more effective.

Lentz, Amy (STORMRECOVERY)

From: Michael Panarello <ant81465@gmail.com>
Sent: Sunday, June 24, 2018 1:26 PM
To: nyshcr.sm.nyscdbg.dr.er
Subject: Project concerns

Sent from my iPhone
My name is Michael Panarello and I am a resident of Joline lane and I have several problems with this project. Number one the pathway creates hazard for the homeowners here being the lack of privacy, and easier access to private property for vandalism and theft. The water hub at the end of page will create the same hazards and it's logical place should be by the conference house, The people who are behind this project don't seem to put themselves in the shoes of the homeowners them selves, however my biggest concern is although it's admitted by the people behind this project that it cannot and will not protect us from a super storm for a title search and yet the obstacles that they want to put in this water way which is a bay not an ocean will create tremendous amounts of navigation Hurdles for fall water crafts let alone an oil tanker or ships carrying hazardous materials. Accident or spill of one of those ships which is for more likely than any super storm that this project already claims it can not save from Will be devastating to this area and it's ecosystem and way of life for years to come. It is amazing that the people involved in this project are avoiding the simplest solution is to projects we all agree that exist and those solutions although far less expensive would be far more affective such as extending the hours. Creating natural rock jetties and pumping sand in between them and putting this project someplace where we could be far more effective. This project will lower the value of houses in this entire area not to mention put a drain on the municipality to upkeep everything which they already don't keep anything now, I also would be concerned as to eight 365 days a year flashing 360° lights in the water that will shine constantly to peoples windows. I have other concerns and I will email them shortly.....!!!!!!□□

Lentz, Amy (STORMRECOVERY)

From: john petersen <johnnpetersen@yahoo.com>
Sent: Monday, July 16, 2018 9:10 PM
To: nyshcr.sm.nyscdbg.dr.er
Subject: response of tottenville beach to living breakwaters final eis
Attachments: (Full) REPORT FROM TOTTENVILLE BEACH.pdf

REPORT FROM TOTTENVILLE BEACH

Being the response from those residents most seriously negatively impacted presently and potentially by the GOSR Tottenville Shoreline Breakwaters Project recently undertaken in cooperation with NYC Department of Parks and Recreation, Conference House Park

Towards the end of 2015, one of the shoreline residents was asked by one of the chairpersons of the GOSR CAC, to provide a response to what was then a preliminary Draft Environmental Impact Statement (EIS) of the Shoreline Proposal (SP)., which might represent an opinion thus far of the SP as outlined in the EIS, and as described more publicly to local residents during a Tottenville shoreline beachwalk which had been recently convoked by the CAC for the purpose of information sharing in situ.

That response was E mailed to the chairperson on 12/14/15, and is reproduced below as a Preface to a longer, more detailed assessment of the SP's potential beneficial versus harmful impact on local residents.

Since this beachwalk was followed by a short coverage by NY 1, "A line in the sand"' highlighting some of the more thought provoking features of the SP revealed during the tour, and since those evolving outcomes were punctuated for the most part by comments from local residents highly critical of the planned section of the SP immediately contiguous to their residential rear yards, this NY 1 presentation and the 12/14/15 E mail as Preface below likely constitute a significant public and semi-public reaction to the SP as presented in that early EIS.

Aside from comments by residents attending previous CAC meetings, the inclusion of the Preface then provides the initial stages of a fairly long term analysis both of the process through which the Final EIS shall have developed and the proposals resulting.

Importantly, the relatively smooth transition from the negative reactions of residents to the earlier EIS and the even more vociferous response to its latest embodiment should thereby come as no surprise to the SP's principals.

From the very start of this proposal's introduction to the residents of the Tottenville Beach area, which for the purpose of this response will be considered as that area between Hylan Blvd and Raritan Bay that was flooded by Sandy at High Tide the afternoon and evening of the storm, running from Swinnerton and the Lenape Playgound on the West, up to a location halfway between Claremont and Billop on the North, and Page Avenue on the East, including approximately 180 properties above Billop Avenue and 66 below, an outstanding aspect of its unfolding has been an utter lack of those resident's participation in the deliberative process, which, we believe, constitutes a severely invalidating weakness, running consistently through every CAC to the present.

In June of 2013, according to the EIS Final Scope of Work, HUD launched a design

competition during which proposals were considered in a “year-long community based design process.”.

Not a single resident from the above described Tottenville Beach area has seen either preliminary or final plans for the proposals that were rejected in the competition. The only official information provided at any time to any of these residents was the singular piece of information that the signed, sealed and delivered winner of the competition was the SP.

“Community-based design process.”?

What qualities then, must be present, and obviously so, to permit a proposal of urban planning to enjoy a classification of “community-based design”?

It would seem intuitive that such qualities would involve necessarily the active presence of those residents, or, at the very least, a representative sampling of those residents most proximately impacted by any such proposal.

In consideration of this apparent dearth of the significance of this dimension of urban planning practice in the minds and plans of the SP’s framers, we believe that the theory of urban planning concerning the role of stakeholders requires a more thorough treatment in order to keep all stakeholders on the same page.

A less superficial exploration will be provided in a Summary Conclusion of this Report, but we think it required of any fruitful mutual understanding of the disparity of viewpoints that arose from and continued throughout this process that the matter at least be approached at this early stage.

Within the context of the EIS, Stakeholder Theory is touted as a primary ingredient of the process, This theory demands that ALL INVOLVED SOCIAL ENTITIES contribute EQUALLY to the final product. When one piece of that puzzle has been denied an effective voice, the entire proposal risks failure of its ability to create felt value (potential for lessening of beach erosion?) in those most affected, and thereby loses its principal raison d’etre as vital link in the chain necessary for entitative and perceived validity.

But, more importantly, it is a great deal more than felt value that is at stake when true and effectively-shared deliberations are not in evidence The very reliability of the project to achieve its desired outcomes becomes, we believe, relentlessly compromised. as we expect our continued evaluation of its processes will demonstrate

Representation on the CAC was indicative from the very start of a bias contrary to any and all values demanded by Stakeholder Theory and the concept of a hierarchy of knowledge, with indigenous knowledge culled from local experience granted pride of place, and the rights of self-governance espoused in all the demands of modern urban planning. Somewhere around 20% of the CAC’s appointed members were actually residents of our study two of eighteen actually living on property abutting the land to be altered by the project.

The CAC information sessions were well publicized but ill attended by those most affected.

Because we were aware of no attempt by the organizers of the meetings to survey the resident's reasons for non-attendance, we conducted surveys ourselves, both formally and informally. We received comments from the majority of residents, either directly or indirectly by inquiring of many whether they were aware of their neighbors' motives,

It became abundantly clear to us that somewhere above ninety percent of those surveyed were laboring under the mistaken impression that the temporary berm set up on the beach would protect them from future flooding from Sandy like storms, which was not the case but was widely allowed to be advanced by publicity provided by the SP and continued unabated and uncorrected, until an article appeared in the S.I. Advance dated 10/29/17, whose title, "After Sandy, project aims to protect against storms", could have easily evinced the ambiguous previous presentations which confused potential lessening of beach erosion with resident protection from flooding,had there not appeared, like an oasis of reason in a desert of confirmation bias, being that tendency to search for or interpret information in a way that confirms one's preconceptions, the "skepticism" of one Tom Matteo, a "Tottenville resident who happens to be borough historian", and at the same time happens to be a victim of Sandy's flooding, who must have suffered an uncontrolled attack of the inability to stifle the logical conclusions that his mind demanded, and was quoted "It's not going to change the flooding, so why are we spending all this money?"

Others opined that they" wanted nothing to do" with government, based on prior disappointment with unfulfilled government promises, Some were "worn out" by unsuccessful contacts with agencies created to provide aid. Some were apathetic about government generally. The result: uninformed, misinformed or do not want to be informed stakeholders.

Can an informant be said to be informing if no one is being informed?

Is a public presenter really presenting in the absence of those most impacted by the information made available to a missing audience?

Equally importantly, then , is it not patent that the absence of the informing/ being informed, full presence and participation of those most proximately and therefore likely enjoying the benefits of an urban project or, in their absence,bearing the brunt of the harm inflicted on themselves and their neighbors execise a dominant influence not only in consideration of a project's likelihood of attaining its desired goals, but at the same time, and for the same reasons and in the same manner, be foremost in any deliberation determining its suitability for official approval and political affirmation?

We now defer the fuller treatment of this participatory deficiency to the Conclusion and move on to an examination of specific flaws in the proposal.

RESPONSE TO LIVING BREAKWATERS/TOTTENVILLE DUNE PROJECT

We believe the process underlying this project is seriously flawed in its approach assumptions, its foreground and background goal limitations and orientation, the biased narrowness of its vision, its heavily mistaken sources of evidence and its salient failure to inform and include those residents of Tottenville most effected by its impact in an early and often deliberative schema.

To begin, we would firstly suggest for your consideration the following two principles of urban planning which seem absent thus far:

1. Due consideration to recent historical preludes to this project which should be understood as

forming the interpretive framework necessary for cooperation. It is hardly arguable that the nature of the Tottenville community and its connection to the waterfront which comprises two of its three margins, forming a sort of peninsula at S.I.'s, N.Y.C.'s and N.Y.S.'s most Southwestern terminus, must not only be taken into account in its present form, but must at the same time be understood as the product of a long history of development.

This development also displays a continual interplay between the unique needs and opportunities of a small town in N.Y.C, and the rights and obligations inherent on both sides of the Town/Municipality relationship.

It is the failure of the planning stages of this undertaking, as we understand them thus far, in this very area of concern to the citizens of Tottenville and of the Tottenville Beach community, that threatens the very core of the project's viability.

In these times privileged more than ever before by civic requirements of reliability, transparency and accountability, any proposed alteration to a community's social or physical constitution must not only optimally, but necessarily mandate these elements to be conspicuous in those in whose hands the decisions rest.

Permit us to enumerate the most outstanding examples of projects potentially seriously impacting this waterfront community in recent memory, accompanied by a critique of these same Municipal plans and actions with the above mentioned viewpoint in mind: 1962- South Shore Arterial Hwy studies completed this year which included acquisition of homes for project. Plan abandoned. 1963- Series of brush fires which could not be contained due to inadequate water supply (water mains of 2-4" diameter which should have been replaced long before w 6-8" mains) Forty one bungalows in Tottenville burned to their foundations. 1973- Conference House Park Addition for which over 300 privately owned lots and 22 homes were acquired in spite of the admission on the part of City Planning that the City had no plans or funds to create a park. Reason for acquisition—a suit by one of the lot owners that she should not be required to continue to pay Real Estate Tax on a lot that was slated to be used for a park, thereby making it unbuildable. 2004(approx.)-Carriage Trail and Russell Pavilion Reconstruction in Conference House Park Addition. Initial plans called for a trail of two strips, 2' wide each, composed of crushed stone with a 2' wide grass median placed on sand along waterfront and through a Tidal Wetland in two foot deep water thence through a Fresh Water Wetland, terminating at the Conference House. When this plan was abandoned due to refusal by NYSDEC to Permit it, changes were made but still allowing it to be placed

on sand adjacent to the Fresh Water Wetland. 25% of trail was scoured into non-existence within two months of construction. Pavilion construction lasted about three years longer, when it was discovered that plastic decking was pulling loose by the rotting of underlying beams which were required to be pressure treated but were simply painted green.

Structure was first taped off to public then semi- demolished and completely fenced in about three years ago, as it remains today another dangerous eyesore.

1

Superstorm Sandy-

Mayor's Office of Emergency Management was formed in 1996 as the lead agency to oversee and coordinate the City's response to large- scale emergencies, which included storm responses. Its offices were located in Building # seven of the WTC, which burned and then collapsed on 9/11.

The offices, located on the upper floors, gave their occupants a terrific view of downtown Manhattan. It was unfortunate that the location was also an extremely vulnerable terrorist target and was even more unfortunate for the First Responders who were thereby deprived of information that would have been crucial in their attempts to bring the emergency under control.

In 2006, this OEM was given several floors of office space in downtown Brooklyn, from which they would be directing the City's response to Sandy.

Superstorm Sandy was well and reliably forecast by the National Weather Bureau more than a week prior to its impact on S.I. The Fire Department had many years prior been planning for such an emergency by issuing flood maps of most seriously threatened areas. Between the FDNY and NYPD, there were more than a dozen rescue rafts and jet skis.

By 9 PM during the night of the storm, it was High Tide in Tottenville Beach and there were reports of at least eleven residents trapped in their homes, two of whom would eventually perish. There were thirty or so Firefighters and an equal number of Police Officers who had responded to a location at the risen water's edge maybe a block and a half from the beach. They just stood and looked into the blackness over water as calm as a lake with no means to transport themselves closer to the storm's victims, since all of the watercraft had been routed to the New Dorp – Midland Beach area.

Insult was added to injury in the storm's aftermath, both immediately and longterm. All of the homes which had been evacuated along the beach were each broken into and looted every single night of the first week, which reinforced residents' belief that the two victims of the storm had remained back fearing for the loss of their possessions to looting.

Again, emergency supplies and equipment were directed to the Eastshore towns, and Tottenville Beach relied as usual, on itself for local volunteers to supply food and lodging for the needy, and eventually for worldwide volunteers to supply longer term requirements.

After more than a year of broken promises and 'Rapid Repair and Reconstruction" by the City, what was officially announced had been known to neglected Tottenville Beach residents for longer than they care to recall. It was a "Failed Program".

The most recent debacle hit the Tottenville Beach shoreline about a year and a half ago. Construction was begun on a "Temporary" berm that was predicted to protect the shoreline residents for a year at a

time, to be rebuilt and replenished periodically before a final plan was deployed. This first berm began to deteriorate in about three months, and at six months it had split open exposing a crevasse about eight feet deep, dangerous to even the most agile and seasoned mountaineer. This state of affairs remained as is, until seven months later the contractor returned to rebuild it, and presently we have returned to the dangerous previous stage, equally ineffective against any storm, and providing the additional benefit of filling our storm water outfalls with its eroding fine grain sand , blocking outflows to the point that homes along the beach now experience flooding every time we have heavy rains, which the DEP has been unable to remedy.

It was some three months ago that we attended a meeting hosted by New Dorp Moravian Church. It was there that a man stood up to ask a question of the Presenter from NYC who had explained that the City was doing its best and had already issued permits for the construction/renovation of over 400 homes, as the third anniversary of the storm approached. The man added that he was still living in a tent in New Dorp Beach and wanted to know how many of these homes had been completed. The Presenter answered that there was but one under construction. Any preacher from that congregation would have envied that golden pause when you could have heard a pin drop. No response, because there could have been none. In the next moment, a couple seated in front of us stood and explained to the audience that they were among the first to choose a “path” to reconstruction, but were told less than a week before this meeting by their architect that it would be at least four years before their future home would begin construction.

The lack of confidence this community exhibits over this proposal only has so much to do with the present. It is rather the end or final stage of a long history of failure, the summation of dreams delayed and lives forever lost, of grand plans conceived and aborted, of millions invested in studies, and ghettos created and endured patiently and not so patiently by those enveloped in its depressing grasp.

Again, again and again. Where is the reliability, transparency and accountability that are required to inspire trust? What may we next expect? A good offer for a used car, or perhaps even a bridge bargain? Well, the City does not disappoint in its eagerness to express its predilection for repeated rounds of built in moral and civil bankruptcy.

2. Proportionality

In this second principle of urban planning, a need is referenced to demonstrate that any otherwise unavoidable negative impact of the plan is proportional to the good for which the plan is to be applied, and/or the problem it is anticipated, with a sufficient degree of certitude, to solve. It is generally agreed that there are at least three elements minimally required for any adequate determination of proportionality:

There must be a clearly desired need for the measure. There must be sufficient evidence that the measure will accomplish its stated goals. There must be no other less damaging, path to achieve the needed results, nor more likely to succeed.

In light of the above qualifications, let us examine some of the issues raised in the “Coastal and Social Resiliency Initiatives EIS Draft Scope of Work”

Layered approach to shoreline resilience....improve coastal resiliency....cumulative effects....actions undertaken will minimize adverse environmental impacts TO THE EXTENT PRACTICABLE. COMMENTS: Principal weaknesses of layered approach include dependency of total plan on effectiveness of each individually. In the event any of the anticipated benefits either does not perform to its

maximum designed efficiency, or even performs minimally, the total expectations of the system suffer. In the event one layer fails entirely, as a weakest link, the entire proposal loses its rationale. Eg—In the event that the in water breakwaters do not completely eliminate shoreline erosion and that the permanent dune is placed upland of the present temporary dune, the valuable Parks' property will, in time, run the risk of being lost to erosion, which would not have been the case had the permanent dune been placed in the location of the temporary, and engineered to protect against erosion, as are the many shoreline barriers and groin systems that have proven their worth over many decades both along NJ ocean beaches, the beaches running Eastward along the NY Long island barrier islands, and the Tottenville shoreline itself.

Moreover, residents of Tottenville Beach have kept track of the shoreline erosion since 1967 using the distance from telephone poles at the foot of each street as measured to piles visible at low tide and have determined and tabulated that there exists a pattern of beach loss AND gain each year. Some years the loss has been as great as 12 feet measured along the horizontal plane, and during others the gain has measured a high of nine feet. In fact, along the beach in question, running from Sprague Ave to Manhattan St, there was a net gain from Sandy and the total difference over the period of 48 years from 1967 to the present has been a loss of two feet.

3. Special Initiatives for Rebuilding and Resiliency

"...two priorities—coastal shoreline protection and PUBLIC ACCESS TO WATERFRONT"

Prior to installation of the temporary berm, there were six streets running from Brighton St on the West to Sprague Ave on the East, that provided direct access for all Tottenville residents to the waterfront. Under the current proposal, every one of these access points will be impeded by a permanent, stone –cored dune which, in order to provide the protection that the plan calls for from an anticipated 100-500 year storm , will loom 16' plus above Mean High Water(MHW). This height would place this obstruction at least five feet above the current temporary berm, and at least eleven feet above the average final elevation of the waterfront streets extant. (The 16 ' figure comes from this same EIS draft, as the height that Sandy surged to in Tottenville).Since the report states that the plan must take into account global warming/rising sea levels and it refers to 100-500 year storms, the "plus" that modifies the 16' would, we might suspect, be rather substantial.

Even in the unlikely event that climbing this 10'+ high monstrosity might be permitted, few would attempt it-certainly not the elderly or the handicapped- and even fewer would allow their children to play on the beach which would be located on its Bayside, hidden from any possible parental supervision by this same obstruction.

USACE Phase II HAZARD MITIGATION PLAN

"Coastal erosion ....bring structures closer to the water's edge....if erosion is not mitigated, the structures will BECOME INUNDATED WITH WATER, resulting in damage or destruction.

Nowhere in the EIS Draft Proposal is there a shred of evidence that the measures proposed will lessen inundation. For the record, Bill Brownjng, of the Living Breakwaters SCAPE(landscape architecture) team, has quite emphatically stated a basic underlying assumption of the plan which, for some reason, seems to be getting amazingly little attention in the presentations so far, or perhaps it has been "swept beneath the rug". "...YOU CANNOT KEEP BACK COASTAL FLOODING IN THE CONTEXT OF CLIMATE CHANGE, but what you can do is ameliorate the force...of storm surges, TO DIMINISH THE

DAMAGE,"He said. He continued,"....move beyond the IMPOSSIBLE SCENARIO of enclosing "DRY" from "WET".

At this stage of the critique, it becomes desirable to elucidate some terms and their application. In the first paragraph above, the author rightly ascribes the damage and destruction to rising water causing flooding(inundation) , which, the author avers, will be "mitigated" by erosion "mitigation".

The second citation, also from the EIS Draft, states quite clearly that it is the author's strong opinion that there is no way to "keep back coastal flooding"

Actually, both statements would seem to be radically misleading when informed by the successful enterprise of a number of cities worldwide to do exactly that-enclose "dry" from "wet".

To wit: In the Netherlands,

The Oosterschelde Barrier, completed in 1986 and expected to last to at least the middle of this century.

The Maeslant Barrier, whose construction began in 1991 and was completed in 1997. Tokyo Bay Barrier, just completing designing stage. And, more locally, in New Orleans, the GEO—IHNC storm surge barrier, a mile and a half long and built in 12 months.

And how about the proposal first floated by Chuck Schumer soon after Sandy and more recently reconsidered by FEMA and NYC " to help guide the future of flood protection in the City", under study by NYU Law Institute for Policy Integrity, which, if it goes forward, will relegate the Tottenville project to a strictly academic exercise, which , if built as proposed in the interim, will provide our residents with a 16' wall obstruction onshore and an expansive "hazard to navigation" to those afloat. Two more objects for Parks to fence in as they have done with the Pavilion.

Running throughout the proposal's tacit assumptions is the concept that the lessening of velocity zone impact could contribute a lion's share of damage control from storms. Even leaving aside wind damage, electric outages, loss of city services and flooding from heavy rainfall, which is a good deal to leave out, should we just consider damages from the storm surge alone, that concept may be found wanting.

There are about 650 homes in Tottenville that were flooded by Sandy's surge. Depending on the date of the flood map one consults, anywhere from six to 22 were designated as being in the Velocity zone.

This means that from one to four percent of these damage prone locations would benefit from the velocity zone mitigation. Even these, however, would still have to contend with not only the same series of flood-caused damages as the rest, but an additional set of problems as well.

Water from a storm surge as well as water from a swollen river overflowing its banks and water exiting the nozzle of a garden hose all derive most of their destructive power from the velocity of the stream. When water meets an object that is moved by the water, the kinetic energy generated by the water's velocity increases directly with the square of the velocity. What this means practically is that in damage caused by moving water velocity is everything. Additionally, the more the stream of water is confined, the greater the velocity. For a given amount of water, the narrower and/or shallower the path it has to travel the more power it is able to transfer to objects in its path. Examples are the power of the surf on the beach, a river flowing along its shallow banks and a fire hose.

When a storm surge strikes an unprotected beach it initially travels along an area of shallow water

created by its own flow. So the velocity and consequent “knockdown” potential is greater. As the water, in the case of Tottenville Beach reaches steeper and steeper uphill inclines, its forward motion decreases as it fills in behind itself creating deeper and deeper paths for its travel, until at its greatest elevation and interior penetration its forward velocity and potential for damage from that velocity reach zero.

So this is what everyone already knows, that the homes toward the upper terminal point of flooding will experience less damage from water velocity, not only because of a lower velocity, but because the homes at the lower end shall have been exposed to water traveling at higher velocities for a greater amount of time and a greater volume of water at greater depths reaching higher elevations.

The greatest of the problems facing the Velocity zone homes when a barrier is in place might very well be the surge created when the water enters or creates a path inland around, through or above the berm, or through a narrow outfall passageway. This has been known to send manhole covers into the air, and scatter any objects it encounters, making missiles of otherwise harmless flotsam and sending heavy timbers and structural elements of homes at other residences.

So the residents of Tottenville Beach would be expected to tolerate the many negative impacts of the project in order that between one and four percent would still experience impacts greater than the rest but less than they might have in a storm that MIGHT occur in their lifetime while they MIGHT still living on the beach and which Might occur before homes are elevated or otherwise protected by a more inclusive barrier system as referenced to above.

Standing water, whether from rain or rise in Bay elevation during storms, also has deleterious effects on residential property by requiring extensive replacement of all surfaces exposed for any length of time, replacement of all electrical fixtures and wiring exposed, furnaces, cherished objects and requiring, in many circumstances, relocation until the tasks can be completed.

Tottenville Beach enjoys presently a distinct advantage over the Eastshore towns in the path of Sandy. The land adjacent to the beach rises steadily as one leaves the beach inland to an elevation at Hylan Blvd of from 25-30 feet above MHT, whereas the Eastshore beaches suffer from the fact that the elevation of Hylan Blvd at their location is no more than a few feet higher than the beach , creating a “Bowl”in which the water from storms can stagnate for weeks or more, creating many more problems for the residents. Sandy reached its high water mark in Tottenville at about 9PM. By midnight it had completely receded, leaving the homes high if not entirely dry.

The standing water problem becomes even more of a concern in most storms because they also, more often than not, are accompanied by heavy downpours, Sandy being a rare exception.

The existing storm water drainage system serving the Tottenville beachfront, newly installed only 24 years ago, has demonstrated itself to be incapable of handling heavy rains since the temporary berm was installed, and thus far the DEP has found the problem to be intractable. What will become of this standing, storm- delivered water when flooding and sand clogged outfalls and a 16 foot high stone cored berm are added to the mix, forming our own Tottenville Beach Bowl?

“Purpose and need....while enhancing shoreline access and use.”

There exists at the foot of Manhattan St, buried remnants of a foundation that immediately following Sandy was a good two to three feet higher than it is today. Though it survived the storm it was among the rip rap and trees that the City paid a contractor to remove in preparation for the temporary berm, Leaving

the area a good deal less protected than previously.

Atop this foundation had stood a boathouse, a yacht club, a dance floor and an attached storage building. The building, and its series of in water driven piles and float, belonged to the Tottenville Yacht Club, which boasted in excess of a hundred families as members, whose vessels were made fast to the piles themselves or to a group of moorings positioned in a large semicircle extending seaward from the Club. It is in the area that the Living Breakwaters Program plan to install their “reef streets”.

The boats were used generally for recreational activities and local travel, with maybe a half dozen used as workboats for harvesting clams, lobstering and commercial fishing..

The storage building was the property of the U.S. Lifesaving Service, for the beach between Manhattan St and Rockaway St was guarded voluntarily by this organization, and the beach raked clean daily by local residents.

The entire structure burned to its foundation during the great fire of 1963, and was never restored. The Bay still supports a great variety of wildlife beneath its surface, which, in turn, feeds a thriving sportfishing industry above.

We have spotted seals and sharks, whales and sea turtles and, more recently, bald eagles in its depths and along its shallows. There are five Island-based yachtclubs and a dozen or more from N.J. that consider the area within the proposal their own. Indeed, were the Breakwaters plan to be adopted and constructed, more than 20% of the waters available to smallcraft at the Western end of the Raritan Bay

would effectively become off limits.

The area in question has, since anyone alive can remember, been composed of a hard sand bottom with very little in the way of obstruction. An excellent location for swimming, fishing, anchoring or even running aground.

Under this proposal, anything North of the channel would be a “Noman’s land”, and a potential nautical graveyard to those unfortunate enough to be uninformed, or fog enshrouded, no matter how buoyed, marked or lit.

As for water skiing, swimming, canoeing or kayaking, anyone unfortunate enough to have their bare feet touch bottom among the reefs would soon learn that the surface of an oysterbed is as sharp as razors, and reefs in any form are the enemies of watercraft and their passengers. Rather than augment shoreline access the plan would likely diminish access both from land and sea for most and entirely rule out access for the many less foolhardy.

As for access for children from the local schools as an educational adjunct to the “Hub”, few school administrators would advise or authorize a program that involved small boats at all, and certainly not to a region so strewn with hazards as a reef system.

“Social Resiliency---increase physical and visual access to water’s edge.”

Even rose-colored glasses cannot see through a 16’+ high berm, nor will a magic carpet transport residents above or around. What world do these planners inhabit?

The EIS Draft goes on with a series of alternate choices to be made:

ALTERNATE 1. NO ACTION At this point, our choice # 1.

FIRST. DO NO HARM !

Urban planners share a primary ethical obligation to avoid doing harm to the lives, communities or environments that may be impacted by their work. This should include not only the avoidance of direct and immediate harm, but implies an obligation to weigh carefully the future consequences and impacts of their work on others.

THIS OBLIGATION IS PARAMOUNT AND CAN AND SHOULD SUPERCEDE the goals otherwise intended without necessarily making perfection the enemy of the good, and can lead to decisions not to undertake or to discontinue a project. Avoidance of harm is a primary ethical obligation, and determining harms and their avoidance in any given situation must be afforded the diligence it rightly deserves.

While we all welcome work beneficial to others and increasing the well-being of communities of individuals, determinations regarding what efforts are appropriate are value-laden and should reflect sustained discussion with those concerned. Such should reflect deliberate and thoughtful consideration of strengths AND WEAKNESSES of potential intended and unintended consequences and long-term impacts on INDIVIDUALS, COMMUNITIES, IDENTITIES, TANGIBLE AND INTANGIBLE HERITAGE AND ENVIRONMENTS.

BIAS

Since we all are circumscribed by our own interpretive frameworks, personal and corporate predilections are unavoidable. The art of planning involves naming, accounting for and controlling these determinants in our deliberations.

In any benefit analysis, planners should take this likelihood into account in coming to the selection of a final choice before proceeding.

OPTIMISM BIAS can be a significant factor that causes planners to believe a project is less at risk of experiencing negative events compared to the perceptions of others less biased.

It is commonly held that there are several factors that might cause optimism bias. Chief among these is the project's desired end state, which in this case is potentially entirely unverifiable—mitigating loss from an event that might very well not even occur in our lifetimes.

This aspect of the project's primary purpose makes its designers particularly susceptible to such influence, especially since it has been designated a pilot project with no time-proven precedents, its only exemplary undertaking being the restoration of a Marina located on the Indian River in Ft. Pierce, Florida, not subject to Ocean wave damage, completed only recently so entirely untested itself, and so otherwise dissimilar to our Tottenville logistics as to be a comparison of apples to oranges. Since the last storm of this magnitude to impact the Tottenville shoreline with such force was probably the Long Island Express of 1938, in which 60 NYC residents lost their lives (Donna of 1960, Edna and Carol of 1954 produced mostly rain in these parts) , it is extremely statistically unlikely that the reliability of predicted performance will have to face reality in the foreseeable future. Such freedom from assessment would tempt even the most stoic and objective planner.

There are also goals that people want and outcomes they wish to see. People tend to focus on finding information that supports what they want to see happen.

Optimism bias influences decisions and forecasts in policy, planning and management, and cost and completion time are often underestimated and benefits overestimated.

This project is riddled with examples of such bias, but it is nowhere more apparent than in its public presentations, which not only focus on the positive but make no mention of the negative until pressed by those upon whom the plan will be perpetrated. Even then, one does not hear phrases like, “OK, then we can change that part of the plan”, or “ we will have to reconsider in the light of that fact”. Instead, we hear, “ mitigate, it will be a challenge,etc.”.

To inspire confidence in the veracity and competence of the planners in consideration of this skewing of evidence toward desired outcomes, a plan’s weaknesses as well as it strengths have to be addressed explicitly from square one. Lacking this essential quality, any engagement with those impacted will remain sterile and occlusive of the project’s forward momentum.

ALTERNATE II—In water breakwaters... key component...located...to optimize wave ht reduction, AVOIDING NAVIGATIONAL IMPACTS protect onshore dune system

Plus Dune Project....larger

Obviously, the success of one both supports and requires the success of the other. This interdependence comprises both its strength and its weakness. If the breakwaters fail to prevent erosion with the dune placed upland of the high tide line, the beach could be lost. If the dune fails to even come into play due to its location, its negative impacts are for naught.

Just some observations on location, location, location. Any realtor will recognize this redundancy. The homes along the waterfront derive as much as half their value from their location . Those next in line appreciate as well with descriptions such as “Waterview, Beach area, short walk to beach”. But this negative impact of the dune is not about money to those who have invested their time, talent AND treasure in the waterfront. It is about identity,and tangible and intangible heritage.

This comparatively unspoiled beach remains our connection to the saltwater domain that covers most of our planet. One can only imagine how many bones of lost fishermen, shellfish remains, old boats with their secrets and memories are buried beneath the Bay’s bottom and the earth below it; how many shanty dwellers and sea captains drew their sustenance from its waters. A pastoral bliss long gone, when Tottenville was a wild and bountiful place, full of salt marshes, still a quick boat ride from Manhattan. We should honor and preserve its monuments and memories, if not for history’s sake, than for our own.

And Alex made a telling remark when he explained that locating the Dune as far as possible from the shoreline was important for the dune’s preservation from storm damage and erosion during our last beachwalk. We could not help but think of the example of the ship berthed in the most protected harbor possible, immune from damaging storms, and the response of the seasoned mariner, “But that’s not what ships are made for.”

We would like to mention again the event already described when a landscape architect from Parks led an entourage along the beach, directing them to place stakes where she decided the route of the proposed carriage trail should be located. As they made their way through the tidal wetland sloshing through the water and hammering stakes, we noticed two men whom we recognized as employees of the DEC trailing behind the group. When asked why they did not inform the director of the stake placement that it was a

protected wetland, the DEC officials replied.” That’s not the process we follow.

Plans will be filed, permits will be applied for, and there will be a comment period, and then the permit will be denied. We must follow the protocol.” So it goes

Until the many other potential alternative possibilities for protection are more fully explored, and a better balance struck between the negative impacts and anticipated benefits, we will continue to refuse to forego the really important questions of this proposal.

GOSR TOTTENVILLE SHORELINE PROJECT
TOTTENVILLE BEACH RESIDENTS RESPONSE
LIVING BREAKWATERS

In the Spring of 1944 Edwin Rommel, AKA “Desert Fox”, and Commander of the German forces along Normandy Beach, France, was busy supervising the manufacture of shallow water obstacles to an anticipated Allied amphibious invasion. Among the obstacles eventually deployed in water whose depth at high water was anticipated to be two to eight feet, were about 5,000 “concrete tetrahedrons”. These, together with about 45,000 obstacles composed of wood and steel, were added to an unknown number of land mines, and were fully in place along the shoreline by 6/1/44.

A short time after the Allied invasion had taken place, a group of U.S.Army Engineers was tasked with studying the effectiveness of this array of obstacles to the shallow water operation of landing craft. The mines deployed were generally found ineffective due to seawater corrosion of firing mechanisms, since they were specifically designed for land use. Hands down, the most efficient fortification by far, according to the study, and the one responsible for the most disabling damage to Allied watercraft, were the concrete tetrahedrons.

The Battle of Brooklyn has been deemed a seminal event in both American and Western history.

On 8/20/1776, when British forces launched, from Staten Island;s Eastshore, their Naval invasion of Long Island’s Western front, there had been placed a series of shallow water obstacles as a deterrent to its success along the shoreline of what is today Brooklyn. We have no available sketch of the precise location of these obstacles, nor any account of their eventual efficacy.

Such is not the case, however, with the placement at Normandy Beach.

The German surveyors, always justly proud of their accomplishments, likely had something to do with our current collection of surveys, even photographs, of the “hazards to navigation” which eerily resemble, in some respects, the arrangements proposed to date, for our own Tottenville Beach shallow water fortification, just as the “concrete tetrahedrons” call to mind the “E concrete” cubes which have been proposed as a central backbone of the “Living Breakwaters” construction.

The point of these two of the many accounts of shoreline fortifications available is that it would be difficult to design a more unfriendly environment for the safe passage of small craft, which, as alluded to in the Preface above, abound in the area of Wards Point Bend under study, and whose operators tend to be among the least experienced.

But what, those of us who are more responsible might ask, of larger vessels, whose passengers like those of smaller craft, would certainly be endangered as well, by those hazards, wholly unnecessary in light of the all too obvious availability of alternate means of dealing with beach erosion employed successfully and at much less cost for years to replenish the beaches elsewhere?

Lingering among these larger vessels, and comprising both their greater numbers, size and most significantly, species of cargo, are the many Tankers (averaging sixteen per 24 hrs.) passing through a channel whose distance from the proposed locations of the artificial reefs, ranges from a tenth to a third of a mile, and whose designation on NOAA Chart # 12331 Raritan Bay and Southern Part of Arthur Kill-- 33Edition 2014 runs from Redbank Reach through Wards Point Bend East,
describing a turn in the channel of 110 degrees, which forms an arc enclosing the area of the study, and averaging 700' in channel width.

These figures become important at this point of our narrative assessment of potential harm latent within the "Breakwaters" phase of the project in order to be able to draw a meaningful and least inaccurate comparison of the conditions within whose parameters any one of the above mentioned sixteen tankers must daily navigate and those conditions of tankers plying the channel named "Valdez Arm", which connects Port Valdez, the Southern terminus of the TransAlaska Pipeline System (TAPS), with the rest of Prince William Sound, Alaska.

This comparison is valid and warranted, we believe because the very event whose recurrence we hope to prevent along our own shoreline by this response to the Breakwaters Project, actually occurred on the periphery of the Valdez Arm with catastrophic results.

DEAD AHEAD

The December 13,1910 edition of the N,Y, Times reported a "grounding on the rocks of Bligh Island, Prince William Sound, Alaska. All 123 persons were taken off safely." The article contained no mention of any environmental impact, unsurprisingly, since awareness in 1910 of the environment's importance to its human inhabitants had not yet achieved the justifiable centrality it enjoys today.

This environmental nonchalance would not obtain, moreover, some seventy-nine years later when one would have thought that environmental concerns and improved electronic aids to navigation might have conspired to prevent, or at least lessen, the impact of such "grounding".

As one of the newest of Exxon Shipping Company's twenty tanker fleet, the Exxon Valdez, departed the Alyeska Pipeline Terminal, at 2112, the eve of Good Friday, she headed for the Valdez Arm, her course set for eventual delivery of 53 million gallons of North Slope crude oil to Long Beach California, according to the Final Report of the Alaska Oil Spill Commission, published 2/90 by the State of Alaska. The report goes on

to state," Shortly after midnight of 3/24, the EXXon Valdez ran hard aground…,the human and natural losses were immense…..The most important loss for many….. was the aesthetic sense that something sacred in the land and waters of Alaska had been defiled. The American people reacted in anger. A spill came to be seen as the nation's biggest environmental disaster since Three Mile Island."

Eventually more than 1300 miles of coastline were fouled, hundreds of animals perished, Exxon spent over $2 billion on the cleanup, countless residents were sickened for years by the fumes from the oil residue, the fishing and maritime industry of the surrounding coastline has not yet resumed to its prior level, and Exxon remains tied up in court cases to this day to the tune of another $3 billion so far,, while many Alaskan beaches remain polluted as well, oil buried just inches below the surface.

The Exxon Valdez (EV) was carrying 53 million gallons of oil, 11 million gallons of which leaked into the Sound and spread SW along the Alaskan peninsula to such an extent that it finally reached a location that was 470 miles from the spill's point of origin at Bligh Reef. and had fouled the entire surface of the Sound with oil to a depth of 4".

Had the same amount of oil been released by a tanker grounding on the proposed Tottenville beach Breakwater, it is estimated that it would have filled the Raritan Bay, N.Y. Harbor, up the Hudson River to Albany,, into Long Island Sound, along the Long Island Beaches and Bays past Cape Cod, and down the East Coast as far as the Carolinas.

The channel that formed the course of the EV through the Valdez Arm (VA) has an average width of 9000', a 3000' outbound lane, a 3000' separation zone, and a 3000' inbound lane.

The channel that directs the course that must be followed by any tanker inbound or outbound along Wards point in Tottenville averages a total width of 700',has no traffic separation zone between lanes, and is required to navigate a 110 degree turn along the Tottenville shoreline adjacent to the proposed Breakwaters location.

Since Prince William Sound lies in an extremely cold environment, pleasure craft are almost nonexistent in its waters. The commercial craft that do work those waters are skippered by professional watermen experienced enough to be depended on to keep clear of ships.

Not so in the case of Raritan Bay's waters, filled during the warmer weather with hundreds of pleasure craft, many jockeying for the preferred location for fishing along the channel's edges, manned mostly by people having little or no experience or knowledge of the dangers that surround them, especially shipping traffic, Additionally there are seven private marinas nearby, the confluence of four shipping channels, commercial boatyards close at hand and a huge holding and staging area for anchored barges, tankers and freighters awaiting Pilots and/or dock availability in the Raritan River or up the Arthur Kill.

The tankers carrying oil from Port Valdez as well as those ranging along the Wards Point Bend are classified as General Purpose Tankers, varying in length from 1000--500 feet, and capacities from the 53 million gallons of EV to the smaller “lighters” which transport petroleum from the larger supertankers confined to deeper waters by their draft.

The average tanker passing along Wards Point might be carrying 10 million gallons of oil and if experiencing a similar 20% loss due to a spill as the EV, would release about 2 million gallons of oil. Should that oil, in turn, disperse in a similar manner to the EV spill, it would likely cover the Raritan Bay, half of the Long Island and New Jersey Atlantic Beaches, and NY Harbor.

Continuing our comparison of estimated risk in both venues, Port Valdez has but two Dock spaces for transferring cargo, 400’ each for a total of 800’.

The Arthur Kill alone has 16 docks with a total of 4000’ of dock space.

These figures would indicate that for every 2 tankers that transit VA, which is born out by Exxon Corporation’s public information in their TAPS book that lists their “turn around time” (for unloading ballast , inspection, and loading cargo) as 22-24 hrs, there are 16 tankers transiting Wards Point Bend. That reduces to a ratio of 8/1, indicating that using frequency of tankers passing a given point alone as a risk indicator, Wards Point Bend has an eight times greater risk.

According to the Sandy Hook Pilots Assoc. Training Manual, there are 40 petroleum shipping terminals in NYC. Reuters.com on 11/12/12 stated that “N.Y. Harbor is the biggest and most important oil-trading hub in the country” , with tankers arriving from all parts of the world on a continuous non-stop basis, using two channels to enter the Harbor, Sandy Hook Channel which continues through Wards Point Bend and Ambrose Channel which guides the rest into the Upper Harbor beneath the Verrazzano Bridge.

If 16 out of 40 lie in the Arthur Kill, it should not be a stretch to estimate 16/40, or 40% of tanker traffic passes Wards Point Bend daily.

And we could count the tankers ourselves.

Regardless, there are a number of other issues that must be addressed in order to establish an accurate comparison.

Chief among these are the following three amendments to tanker operations that grew from the need to reevaluate tanker safety in lieu of the EV incident:

Note: We believe it is extremely important in our consideration of risk to bear in mind that in the study of the EV disaster and others ,the various Government regulatory agencies that are in involved in the Permitting process gave the Green Light to both the TAPS and its associated ship routing prior to the two disasters we will be studying.

It is in relation to this very process of Permitting itself, and its frequently tacit assumption that the approvals from all agencies having jurisdiction somehow constitute reliable assurance that all will be well, that a major portion of our response will be

devoted to attempts to learn “a better way” to protect ourselves from harm, a way that employs, enables, encourages and most importantly demands input from the primary communities impacted from the very conception of a need for any urban planning project. This has not at all been in evidence in the early stages of choosing this project for Tottenville Beach, and its complete inability to both satisfy the real needs of the community or even to avoid the associated potential harm which, we hope to demonstrate is many times greater than any hoped-for benefit..

1. The first of these changes to tanker operation involves structural alterations in the construction of new vessels and is international in scope. It is the requirement that all tankers be built with double hulls, that is, a second skin of steel inside of and parallel to the main outside surface of the vessel, but applies exclusively to those vessels of 5000 Dead Weight Tonnage, which includes most, but not all, tankers doing business in N.Y. Harbor
2. The second involves the reporting of oil spills and, simply put, requires all oil spills > 7 Tons to be reported.

Of all the regulations concerning the Maritime Trades that evolved directly from the EV spill, these two stand out as being the most novel and relevant to our calculation of risk.

Over the last twenty years of experience with this new method of constructing and operating double-hulled tankers, however, many problems which were not anticipated have come to light.

The hopes that this new construction might reduce the risks to marine pollution due to grounding have been tempered by the following statistics:

1. Double-hulls have less stability than single hulls,raising a ship’s center of gravity and reducing its metacentric height, leading to a reduction in its seaworthiness and increasing likelihood of heeling to one side in any grounding.

2. Surface area maintenance---doubling of intra-hull confined spaces has led to greater susceptibility to hull fractures, stress concentrations and fatigue of structural members and joining techniques.

3. The grounding statistics for tankers worldwide demonstrate no significant decrease in incidence of spills.

4. Double--hulls are not inspection friendly, resulting in tankers poorly maintained and operated, prone more than ever to catastrophic structural failure due to lower standards of inspection and maintenance, unaffected by numerous new guidelines which have been found unenforceable. In the opinion of many marine engineering firms, this last development might actually increase not only the incidence of structural damage from groundings but its severity as well, leading to an increase in the quantity of oil lost per incident.

5 The history of ship structural design is one of evolution rather than revolution.

Despite the advent of computers and structural analysis programs, structural design remains a largely empirical process likely to continue so in the foreseeable future.

CONCLUSION OF OIL COMPANIES INTERNATIONAL MARINE FORUM

"Poorly designed, constructed, maintained and operated double-hulled tankers have as much if not more potential for disaster."

How about the regulatory figure of > 7 Tons spill =42 Barrels = 1750 gallons? This is considerably less than the 2 million gallon plus spill that might result in Wards Point Bend, but it begs the question, "Were there any requirements at all for reporting prior to this regulation, and what measures might there have been or currently are in place to keep the hands of vested interests off the scale?

There have been at least two such spills in that area of the Raritan Bay between Wolfe's Pond down through Tottenville Beach. since the early 1950's that left large globs of oil on area beaches. So much so that it was difficult at times to approach the water's edge by land without wading through said globs.

The last was finally cleaned up by skimming the surface of Tottenville Beach with front end loaders around 1980.

This means that the figures below do not include spills < 7 Tons, and more likely than not, do not include many that managed to avoid detection.

WORLDWIDE TOTAL SPILLS	1974--2016	BY	GROUNDING		530
"	"	"	2006-2016	"	"	121
"	"	"	2016	extrapolated		12

TO ERR IS HUMAN

Should one speculate that the advances in electronic navigation equipment might make spills by grounding less likely, keep in mind that the figure of 80% of shipping collisions attributed to "Human error" has remained steady since the EV spill, and lest one might be led to believe that our species, and the Maritime Trade in general, might be expected to become less error-prone with the passage of time, consider the following series of sobering maritime collisions which all occurred under the watchful guidance of our own 7th Naval Fleet (Pacific) in the course of 11 months of 2017, keeping in mind that as a military organization in peace time, one might expect the crews of such vessels to be among the most disciplined and well-trained in the world.

US WARSHIP COLLISIONS 7th FLEET 2017

1. USS ANTIETAM runs aground, spilling oil. Guided-missile destroyer.1100 gallons dumped into Tokyo Bay. $4.2 million in damage. 1/31
2. USS LAKE CHAMPLAIN collides with S. Korean fishing boat. Guided-missile cruiser. Sea of Japan. 5/9
3. USS FITZGERALD collides with Phillipine container ship. Seven sailors killed. Japan 6/17
4. USS JOHN S. MCCAIN collides with merchant ship. Ten US soldiers killed

East of Singapore 8/21

5. USS BENFOLD Guided-missile destroyer collided with commercial vessel. 11/18

It is important to note that the above amendments to shipping regulations were dominantly guided NOT by government entities but by non-government international Maritime concerns.

So what measures, we might ask ourselves, were taken by our own Coast Guard to "prevent" (in the current jargon of the GOSR, "mitigate") future groundings on Bligh Reef? U.S. Code 33 Section 2733 mandated the operation on Bligh Reef of an automated navigation light to prevent future groundings. Despite these efforts, the vessel PATHFINDER ran aground on Bligh Reef 12/24/2009, again spilling petroleum into the Sound.

We might speculate that the Citizens Advisory Committee of Alyeska could function as a model of efficiency as it required after the 1989 EV disaster that all tankers be escorted more than 70 miles through Prince William Sound to the Gulf of Alaska by two tugboats. Such was the political and financial pressure to maintain the flow of Prudhoe Bay oil to the West coast of our country, comprising about 20% of the national supply, comparing to 20-30% routed through NYC, that PATHFINDER et al spills are likely to continue to grace the headlines for some time to come, regardless of promises of all vested interests to the contrary. Statistics, we may recall, have a fascinatingly educational way of taking on a whole new relevance when we become one.

NOAA Chart # 16708 PRINCE WILLIAM SOUND-PORT FIDALGO AND VALDEZ ARM covers an area of approximately 1600 square miles, which is the Raritan Bay 20X over. Yet Bligh Island has the only named reef on the entire chart.

Prior to the 1989 EV spill, all government agencies having jurisdiction, to all appearances, considered the grounding of a tanker, belly filled with oil, so remote that these later rules mentioned above were considered superfluous, yet following the event of EV, all hell breaks loose and more stringent measures are added, again (and again and again…) with protestations of "mitigation" and more empty promises.

We human hominids derive a great deal of our self-understanding from the manner in which we are able to differentiate ourselves from "lesser" species. And it is precisely in this area of our humanity, specifically our ability to learn not only from our own experience and the experience of our contemporaries, but from the experiences and the lessons learned from those experiences of our forebears. This reason alone should raise a red flag whenever we fail to strive for constant vigilance concerning matters of potential harm to any community, and especially whenever a community recently suffering the social, financial, psychological and environmental grief of the Tottenville Beach area happens to be the subject of that harm.

Another factor influencing the risk of potential harm is an obvious comparison of water depth between the Valdez Arm channel and Bligh Reef., more than sufficient to permit safe passage of EV, and the Wards Point Bend and Breakwaters project location, shallowing to a depth at mean high tide of seven to ten feet in some locations.

An oil laden tanker transiting Wards Point Bend has a minimum of 12-15' draft, in the example of the "lighters" that shuttle their cargo from the larger vessels, to 15-30' draft for the larger vessels.

In light of the two actual groundings of such vessels that actually took place in the area under study within a single decade beginning about 40 years ago, the issue of whether such a grounding in the shallow flats within which the proposed Breakwaters will be located becomes academic,yet worth relating for those still skeptical.

The explanation likely lies inches below a layer of sand covering the floor of the Bay, which sand provided habitat for the variety of shellfish indigenous to the Bay, where a slippery gray clay a few feet thick awaits any tanker's flat-bottom surface as it strays from the channel. Ask any local clammer who scoured the Bay's flats years ago, or anyone so unfortunate as to have his or her car stuck on the areas beaches as its drive wheels churn through the upper layer of sand and settle into the disablibling gray slime below.

Or ask those police officers, firefighters and local residents who listened to a ship's fog horn blare its plaintive warning at steady intervals for hours ranging from 2AM to sunup one foggy night about 38 years ago. Ask them what the Coast Guard was telling them on their radios that had been observed on radar and heard from the grounded tankers Captain, that his tanker was hard aground facing North in a position no more than 150' from the beaches High Tide Mark.

As the fog slowly dispersed all were truly amazed at the sight of a huge bulbous bow resting comfortably in water no more than two feet deep, the lower portion of the bow of a huge tanker whose lowest topsides could been observed in the now clear water covered in the clay that one must surmise provided the "slippery slope" of a magic carpet ride from the distant edge of the channel, and whose viscosity, many times greater than the watery realm for which its rudder was designed, no doubt prevented any control of the vessel's course, had the helmsman desired to exercise it.

Further on in our comparison of the two watery venues under scrutiny, we come across two distinctly different waterways, each so different from the other in its attendant risks to the passage of tankers as to invite the comparison of night to day.

On the one hand, the Wards Point Bend channel whose width varies from 600-800', allowing scant "elbow room", particularly during the transit of the 110 degree turn and taking into account the leeway that may be required to allow for wind, current and the myriad other hazards to navigation, cross-channel and within its confines, always unpredictable thanks to the inexperience of its operators (canoes, kayaks, jet skies, sail

boats large and small,fishermen out for a day and the larger vessels standing buy or possibly dragging their anchors in a stiff wind cross channel).and whose channel markers as seen from a distance blend in confusingly at the turn ahead both with the other red and green markers of the channel turn itself, and the plethora of lights glaring from the nearby heavily populated shores of the Amboys of N.J.

Contrast this with the straight run provided by a channel whose width varies from 8000-12000', which is a full 13X the width just described above, and the relatively uninhabited shoreline devoid of lights presented by the VA channel., throw in the almost complete lack of unpredictable hazards along the route and the availability of deep water nearby allowing for maneuverability even at the waterways edges and a 3000' wide traffic separation zone to avoid inbound traffic, and our comparison continues to extremely heavily favor the VA as by far the route less risk prone.

It can hardly be disputed that the Wards Point Bend, with its 110 degree turn, narrower width, even in conditions of excellent visibility, confronts any vessel's navigator with a much more challenging perspective, increasing risk many times over.

Every experienced tanker skipper is well aware of the difficulties inherent in maneuvering a large vessel through narrow waterways, along with additional risks associated with attempts to discern the locations and intentions of other vessels alongside of and even within the channel ahead and behind. Compounding this challenge is the almost impossible task of successfully performing these calculations when the observer's perspective is other than straight ahead. A complex of red and green channel markers present themselves day and night as soldiers lined up on their respective sides of a channel that allow the navigator to visually determine locations and directions of travel relative to the tanker's ongoing predictable course.

Not so when the channel ahead snakes right or left, allowing the red and green to appear interspersed and any vessel or object ahead to become indistinct in its relation to its location within, outside of, approaching or receding from the channel's location and boundaries ahead.

The experienced mariner also is well aware that a visual fix is a priority, when available, and that other aids to navigation are precisely what their names imply, aids rather than a primary means of assessing the nature of the path forward and always fraught with possibility of indirection and misunderstanding themselves.

We list below additional factors relevant to the above:

1,. At best, spill response efforts can hope to recover only 10% of the oil that hits the water. Efforts are generally confined to containment rather than removal, leaving > 90% of the oil to continue contaminating effects for who knows how long.

Mike Munger, executive director of the COOKE INLET REGIONAL CITIZENS ADVISORY COUNCIL " Once you let the genie out of the bottle,it's really hard to get it back in."

2. VALDEZ LINGERING OIL EXECUTIVE SUMMARY 2/2016
"Oil will still be present for decades to come"

3. ALASKA DEC COMMISSION 2/90 Ways to measure spill severity"
Volume spilled, extent of environmental damage, cost of cleanup. Dan Lawn

4. Urban planning that proceeds with historical blinders on will almost certainly fall victim to past errors. We must plan with the knowledge that we are not inerrant.

5. The chaos caused by the EV spill was compared by the ADEC to Pearl Harbor.

6. "Grounding accounts for about ⅓ of commercial ship accidents and ranks second in frequency after ship on ship collisions.

7. NOAA Response and Restoration Blog. "While oil spills happen almost every day….Exxon Valdez spill has become a touchstone event in many ways, one to be learned from even decades after the fact."

"Long before the Exxon Valdez tanker ran aground on Bligh Reef in Prince William Sound, a series of events were building that would enable this catastrophic marine accident to unfold as it did, beginning with the opening of the TransAlaskaPipeline in 1977. Politics, profits and jobs drove this decision to run tankers, some of the largest and most potentially environmentally damaging vessels, through one of the world's most environmentally sensitive areas." "Fuel crisis forced decision, untold riches promised, s____load of $ coming to Alaska."

8. 75% of commercial shipping occurs at night.

LIVING BREAKWATERS SUMMARY AND CONCLUSION

Comparative Risk Assessment, EV and Wards Point Bend

1. Chances of leaving channel:
   For avoidance of obstacles 3/1 WPB
   Unintentionally, narrower channel width & turn limiting judgement 2/1 WPB
2. Maneuverability once out of channel to avoid grounding
   EV 100% WPB 0% 2/1 WPB
3. Opportunities for leaving channel based on # of tankers /day 8/1 WPB

Based on # 1 and 2 above, chances of leaving channel and grounding are at least 2/1 in favor of WPB. Multiply this 2 to 1 greater risk of Wards Point Bend by the 8X more opportunities to take the risk and result is WPB has a 16X greater chance of grounding Outside the channel. Take into account that the EV, once having left the channel had the ability to maneuver that was no less efficient than it was within the channel, and the differences increase even moreso.

Comparative Risk Assessment based on 2 million gallon spill WPB:

Scope: Geographic 2500 square miles conservatively.
Temporal generations

Type: Environmental Degree: enormous
Anthropological Degree : heavily populated area

Referring back to P 3 # 2 Proportionallity, in the preface, we reiterate:

The need is neither immediate nor has it been requested by any members of the residents most affected.

The very concept of planning based on weather patterns predicted decades in advance is highly questionable. Waves in Raritan Bay are 99% wind generated Wind patterns are part and parcel of weather patterns. Weather prediction is unreliable more than ten days in advance. The wave velocity, period and direction was monitored in one ;location for maybe two years. The area in question has countless eddies, both forward and reverse, which affect shore impact differently in as many different locations as there will be reefs, since wind generated waves' quality depends as well on current direction, changing constantly throughout the tidal and lunar cycle. The rotational vortices have also managed to traditionally elude linear detection and prognostication methods. Good example on a larger scale is middle North Altantic Gulf Stream. Clint Eastwood,"If you want a guarantee, buy a toaster"

Finally, "There must be no other less damaging path to achieve the needed results, nor more likely to succeed."

Based on this last sentence alone, this project should never have left the ground.

GOSR LIVING BREAKWATERS, FUTURE HOME AND ROOSTING/FEEDING GROUNDS FOR GULLS OF STATEN ISLAND AND NEW JERSEY

Jonathan Livingston Seagull is both the title of a novel by Richard Bach, published in 1970, and the name of its main character.

It relates the life of an unusually creative gull that becomes so enthralled with the art of flying that it is ultimately ushered into a kingdom of superior gulls who not only share Jonathan's delight in flight but share with him more profound ideas as well.

More realistic and apropos of the relationship that promises to become a reality right here on Tottenville Beach should the Shoreline Project reach fruition, between our feathered neighbors and ourselves, might be A. Hitchcock's Bodega Bay , California thriller where "The Birds" inexplicably turned on the human population en masse.

And this type of unanticipated gull behavior has actually been menacing European populations for the past decade, where in 2015 gulls were declared Britain's "Public enemy # 1", and finds North American antecedents along our own East Coast, where vacation havens have been viciously assaulted by these predatory opportunists.

While the residents of Tottenville Beach see the provisions of the proposed artificial reef system for breeding and feeding grounds for marine species as a commonly shared benefit which, at the same time has its significant number of detractors equally respected in the Oceanographic academic community, we are concerned with the equal or much greater likelihood of harmful effects afforded by unwelcome fauna whose primary if not solitary predilection for precisely the sort of morsels served along the reefs is a matter of public record.

This breeding/ feeding process would likely involve a major issue with Gulls, whose habits of scavenging and gregarious traits present major health concerns.

At times preferring blood to more banal menus, they have been known to attack humans and their pets in aggressive groups, nest in cooperative colonies along shorelines and particularly prefer exactly what the proposed breakwaters would seem to tantalizingly provide in abundance.

Allowing that this year's annual bird count puts them in the #2 spot, closely following Canada Geese, their ever increasing numbers do not bode well.

Having one of the longest life expectancies of bird species(up to 49 years), the waters adjacent to the reefs would harbor their favorite culinary delights, providing a conveniently located "open for business" seaside diner, only a few seconds flight from some of their favorite perches and overnight roosts, rooftops and backyard barbecues.

Ever been “decorated from above”,”mugged for your sandwich” or wakenned at 4AM by a squawking flock of scavenging predators?

Gulls have damaged roofs and gutters and blocked gas flues with nesting materials which have caused serious consequences when they are prevented from venting properly.

We are faced with the probability of creating Frankenstein monsters by our providing ideal feeding/ nesting sites.

As it turns out, this may be the least of our gull worries.

Gulls carry a host of superbugs through the skies, migrating hundreds of thousands of miles carrying antibiotic resistant bacteria special delivery to their favorites of the conveniently located Tottenville Breakwater homesites.

HVAC systems can spread airborne spores into homes and commercial occupancies.

There are 83 different species of harmful bacteria in gull droppings.

Some observations:

90% of seagull feces contain Enterococcus, causing antibiotic resistant infections.

Airborne spores from drying gull droppings cause several thousand cases of Salmonella a year.

Airborne gull particles are a fungi and bacteria breeding ground for infectious agents.

There is no known cure for internal fungal infections.

Gull fecal droppings can enter an open wound or cut and result in severe blood sepsis or internal infection.

TRANSMISSiBLE DISEASE ASSOCIATED WITH GULL DROPPINGS

Histoplasmosis-- respiratory disease that may be fatal.

Candidiasis---infects respiratory system, intestine and urogenital tract.

Cryptococcosis---pulmonary disease and infection of Central Nervous System.

Encephalitis--inflammation of nervous system--may result in paralysis, coma or death.

Gulls vigorously safeguard offspring with aggressive behavior.

Return to same nesting site for many years.

Large noisy flocks, sleep atop homes,breeding on islands and coastal beaches.

Frequently an infestation problem on islands and beaches.

Comunicate loudly, screech and squawk.

If it breathes, grows or moves, or did so recently, its dinner.

Every species on the brink of extinction has a good reason for being there: they are fussy feeders, they freeze to death in a stiff wind, they only breed every third moon of a leap year etc. Gulls, on the other hand, are extremely adaptable.

When gulls eat anything infectious, they puke it up.

Gulls can drink seawater.

Gulls high reproductive success, coupled with incredibly flexible feeding habits, means populations are skyrocketing.

Hard to believe that , in spite of the above, they are protected.

TOTTENVILLE SHORELINE RESPONSE; CASE STUDY
SAGA OF THE TANKS

Henrik Ibsen's popular play, "An Enemy of the People", relates a theme which recurs frequently in many other popular movies today and which, we believe, may shed a more thorough understanding on some of the instincts that may very well be driving the Project in question.

The play describes the plight of a Medical Doctor whose job in a town that has therapeutic baths that serve as an attraction to a paying public, is to certify periodically to their safety. When the Doctor determines that the baths have become contaminated and thereby unfit for public use, the livelihood of some of the townspeople is threatened, and the Doctor is labeled an "Enemy of the people."

The play's concept's relevance to our discussion lies in its underlying reference to the environmental issues at hand,, which in the issues before us along the Tottenville shoreline, vie for ascendancy with certain economic interests, or, at the very least,, the role of economic-driven standards measured against those espoused and dictated by more narrowly-focused local requirements of quality of life.

There continues to exist today a piquant reminder of a not dissimilar controversy that worked itself out along another S.I. shoreline, that of the Arthur Kill, in the early 1970's'.

When the quality of life is considered less than foremost in urban planning, it soon leads to threats to life itself.

Perhaps no more eminent memorial to this aspect of lack of attention to the real concerns of local neighborhoods still looms above commuters as they drive the Bloomfield/Rossville stretch of the Westshore Parkway beneath the twin fourteen-story behemoths built with Government and particularly Mayoral, blessings, in 1975', only continuously empty due to the combination of a disastrous maintenance explosion which took the lives of 37 workers and 3 inspectors in a nearby storage tank, the opposition of local residents(BLAST), and the fortuitous withdrawal of a corporation that backed the construction, due to anticipated delays. It was only in the aftermath of these events that the majority of local elected officials finally acted on local residents' objections to the siting, transportation and storage of a product as dangerous to life and property as LNG in the vicinity of a residential area, and today the prohibition encoded in our Municipal statutes makes the five boroughs of NYC the only counties within the State where such new siting remains so forbidden.

These dual crumbling concrete and rusting steel cylindrical contradictions to an otherwise potentially pristine shoreline have remained since their construction 43 years ago a stark reminder of the loss of a 68 acre site to a more residential friendly use.

In 1970, Distrigas Corporation, owners of the originally 100 acre plot in the Rossville section of S.I., close by the Arthur Kill, applied for and received permits from various government agencies then having jurisdiction, to construct the two LNG storage tanks whose assembly was completed in 1975.

It was during this time that a small group of local homeowners persistently protested this project on the grounds that it was enormously unsafe and the danger it represented should not be allowed.to threaten any residential neighborhood.The odds of a devastating accident being low, were high enough in light of the catastrophic possibilities that the plan was labeled “reckless and totally unacceptable.”

It was not, however, until an explosion in a smaller storage tank in a nearby neighborhood, Bloomfield, caused the death of 37 workers and three inspectors, that the larger public and elected officials finally accorded the danger the attention it deserved, and began a series of legal maneuvers to delay the filling of the tanks which culminated in the owners of the tanks abandoning the project and leaving the tanks as a memorial to a system of sometimes dysfunctional government oversight and courageous but frequently ineffective attempts by concerned residents to provide the indigenous wisdom always helpful and occasionally crucial to urban planning.

Among the lessons to be learned from this outstanding example, as well as from the many other examples mentioned in the Preface, few are more pertinent to this discussion nor more timely than the issue of proportionality in urban planning.

As in our comparison above in the case of the Breakwaters, where the potential harm from a catastrophic oil spill would seem to overwhelmingly rule out any plan which might include concrete “hazards to navigation” as an essential component, any suggestion that siting any chemical whose explosive properties even approach those of LNG in quantities described by the dimensions of the two tanks would seem counterintuitive to any objective participant in the permitting process, and a further investigation beyond face value should only confirm the dangers posed during an initial assessment as well.

Two questions would seem to assert themselves at this point with such urgency that, again, an impartial observer might be unable to avoid asking them.

What might be factors influencing such deliberations on the part of permitting agencies to grant the “Go ahead” to such constructions in spite of evidence in support of a robust denial of permits, and where were those elected officials and what were they thinking or not thinking as the permitting process wound its way toward its unfortunate but foreseeable conclusion? And where was the press, the investigative reporting for which our country prides itself and that maintains information sources in business?

Most discouraging, and most confusing, all this in spite of the ominous witness of those most directly impacted, present and future, in the event of the tanks placement and operation, the local residents.

Since it has become commonplace to deride this last, the local residents' response to what they believe to be undesirable changes to their environs brought about in the urban planning process, perhaps it might be a wise place to begin our inquiry with an attempt to explore some of the possible energizers of this attitude.

The usual acronyms, NIMBY and BANANA, are more often than not applied to those neighborhoods whose residents employ a knee-jerk reaction to any and all proposed alterations to what they consider to be the stability of their community.

As such, any proposals might be rejected out-of-hand. regardless of merit.

Both the David and Goliath struggle of the LNG tanks and the Tottenville Beach Proposal include examples of this reaction, though from somewhat different economic perspectives.

The neighborhoods of both the Rossville section of the 1970's and the Tottenville Beach area are composed of older residents and homes that are gradually being displaced by a younger generation of homes and their owners. The difference of perspective mentioned above arises from some homes being more proximate to the water's edge than others. The closer one's home is to both the dangers of the Bay's rising waters during storms due to low property elevations and the accompanying views and ready accessibility of the beach itself, the greater the impact of any beach project on quality of life and property values.

So it is tempting to conclude that the vociferous negative reaction to the Tottenville project underway on the part of Beach residents is merely the typical NIMBY response.

It also is probably fair to conclude that the creators of BLAST were seen as Nimby citizens by many of their peers. A primary distinction whose significance should not be lost sight of, moreover, must be that careful examination of benefit versus harm required of both the planners of urban projects and ALL the stakeholders: residents, elected officials, agencies exercising jurisdiction and the press.

It is only if and when any proposal, extremely importantly from its conception through its completion, passes muster in this all-encompassing category of potential benefit as measured against potential harm, that any inclusion of the possible selfish motives of a minority should even be given passing attention.

As to the question of the activity or inactivity of the agencies one of whose missions is the permitting process, two major elements of this process may better inform our inquiry of possibilities to explain how permits may have been issued to build the Rossville tanks and/or may yet be issued for the Tottenville proposal.

We believe both elements deserve a closer look due to what we would label a dysfunction inherent in the permitting process itself.

The first of these elements might be called "Proximity"

By “Proximity” we refer to frame of reference, or field of view, long vs short view’ spatially and temporally. It is always important to look at the big picture as well as the close up, to zoom in and out, near and far, today and years from now.

There is a huge tendency for planners to overlook the particular in favor of the general, the subjective in favor of the objective, to remain unconcerned with what it might be like to spend a day or two or a year or ten, in the shoes of those “in the trenches”.

Yet this very tendency flies in the very face of all that our own history as a nation has taught us about representative government, from Pericles of ancient Greece, through John Stuart Mill’s application to our fledgling laws today, as a “Promethean environmental archetype”, and finally to generally agreed upon principles of urban planning in our own times.

Acknowledging that governing power automatically gravitates toward the center, the purpose of our laws and our local urban planning is aimed at preventing its happening.

The centralization of decision making destroys liberty by removing that function from those at the local level and transferring it to a central authority, which gradually “benumbs” the spirit of participation among local populations (witness the extremely low turnout of local residents at the public information events) who cease to be involved in community affairs (eg-- elections), seek anonymity and desire neither a voice nor a vote.

So the goal of today’s valid urban planning is and should be a more participatory approach, a movement from passive acceptance on the part of local residents to active choice, having profound implications in a democratic culture. The desired goal necessary for effective planning must include a movement of citizens at the most local level and most impacted by that same planning from paternalism to actively informed consent, at the same time reconciling the tension between the technical and the popular, and improving consensus building and conflict management.

Elements such as who participates and in what decisions, whether they have access to formulating options or only react to options already formulated, disclosure and characterization of impact, the way professionals interact with non--professionals, use and misuse of technical and professional information, all determine the validity of any planning process today.

Paternalism, no matter how nobly motivated, has no place in urban planning.

To date, the Tottenville Beach Project evidences qualities of the antiquated “DECIDE, ANNOUNCE, DEFEND” paradigm, from the initial delivery of the already chosen proposal to the “:mitigation “ approach at every objection, to the general acceptance of the denial of any fruitful dialog, by relegating the give and take inherent in any real communication between concerned parties to a question period exercised verbally followed by written responses months later in a format couched in the protective shield

of internet access, too little and too late to arouse even the most zealous of those impacted by the proposals' most damaging concomitants.

At least equally if not primarily of consequence must be the weighty issue of an ethical dimension of urban planning, necessarily accounting for popular sovereignty.

To what degree are potential harms accepted or rejected by those impacted rather than those designing? How does the perception of such harm differ from those residents today to those who will live here tomorrow?

What populations are most and least vulnerable and to what degree?

What are the ethical standards of using the unjustified respect accorded modern sciences to persuade the more credulous, especially under conditions where there is either fundamental disagreement within the scientific community itself, or where models and data suffer the weakness of inadequately small cohorts over equally inapt time spans?

The second element, and one that would seem to constitute the very foundation upon which any justification of either the LNG tanks' or the Tottenville project's eventual permitting might rest, can be summed up in all the implications of the disuse to which both projects' supporters subject the term "Mitigation".

Sprinkled over all, like confectioners' sugar, the concept of "mitigation" masks what can only be presumed to be duplicity. We have come to expect several slick pages of texts and asterisks presenting an idealized view of "All will be well " in Shangri-la.

Among this peculiar mix of overconfident reductionism and crowing self aggrandizement, a carefully crafted collection of improbable outcomes offers an internally incoherent vision of the Tottenville projects' outcome, with the term "Mitigation "appearing at every turn of every phrase, from the very justification of the project's inception described as "erosion mitigation"through any and all objections to its continuation being subject to "Mitigation".

Consider for a moment, the application of this justification to a more mundane example.

You discover that your home appliance has failed to function as desired. Consulting the Internet's list of appliance repair companies, you request an appointment. The repairman shows up, examines the appliance, and offers you "the deal of the century".

He will not only forgo the usual offer of a "repair" allowing the use of the appliance as the manufacturer intended and as other repairmen might provide for, this "deal" will involve "mitigation", which is an even better offer. Initially convinced by the repairman's sincerity and the company's otherwise sterling reputation, you ask for the cost and the availability of a guarantee. "$4,000.00," comes the reply, and "guarantees are for pessimists. We only deal with optimists." "But", you respond, "the appliance is available brand new for only $500.00." Now here is where really superior salesman training shows its colors. "What makes this the deal of the century," the repairman declares,

“Is that there is absolutely no cost to you. Our company will foot the entire bill.” Now your suspicions are really aroused, so you request more information as to the source of the money. “ My company,’ the repairman goes on to explain,’has tapped into what we affectionately call “The Money Tree”.”This source of an infinite supply of cash actually goes by many names, such as GOSR, the Feds, the Budget etc but not to worry ,how can you pass up a deal like this, all FREE. It is like someone has deposited $4000.00 in your bank account. Something for nothing.”

“Shades of the Garden of Eden,”, you think to yourself, as you sign on the dotted line, only to learn down the road apiece that “Mitigation” has very little to do with repair, and that you have been swindled by glossy advertising thinly clad with a veneer of the company’s respectability.

And here is where the comparison really begins to break down,for to believe in either the sincerity or the freedom from ineptitude of the repairmen hawking the Tottenville Beach Project one would be required to be not only as gullible in contract scrutiny as the appliance owner above, but entirely ignorant of recent historical precedents to this offer.

Adding to the historical precedents mentioned as failures in the Preface above, recall the more recent article in the S.I. Advance relating the trip New York’s elected officials undertook to New Orleans shortly after Sandy, whose purpose, the Advance asserted, was to determine the most blatant mistakes made by New Orleans’ officials following their own hurricane in 2005, in order that New York City might avoid repeating these mistakes.

The follow up article, also in the Advance, interviewed these same officials upon their return, determining that their “Take” on mistakes made and lessons learned could be summed up in, “Avoid a house by house approach that might result in cookie-cutter type street configurations with building heights haphazardly configured contrary to the intent of Zoning rules, and do not rebuild/elevate homes at a cost greater than the homes’ pre-storm value.”

Again, according to the Advance, the first S.I.home elevated under the City’s plan was a bungalow elevated at a cost of $700,000.00, which appeared to be worth $300,000.00, and another elevated more recently in Great Kills which appeared to be worth no more than $400,000.00 in the NY 1 interview , and had recently suffered the additional misfortune of a fire caused by faulty wiring installed by the City, which had been elevated by the City at a total bite taken out of the “Money tree” of in excess of one million dollars.

Again, upon assuming his duties as Mayor, one of the first statements concerning Sandy made by Mayor DeBlasio was that the previous Mayor’s administration’s efforts were a failure and that his new administration would not be repeating such mistakes.

Some two years later, a “Build it Broke” program interviewed the Mayor to the effect that his administration’s efforts were also a failure.

So the wise resident of any Sandy ravaged neighborhood learns to take such promises with a grain of salt.

And that same resident, were he to learn from all of the above, would not go for the $70 million carrot dangling tantalizingly before his Sandy-weary body, any more than the residents of Sandy ravaged Eastshore communities might relax their guard for the $600 million recently offered by the Governor for the Eastshore boardwalk.

These projects’ efficacy against Sandy-like storms will more than likely never be tested during the tenure of our local political figures, so it is our own present ability to weather the harm created by these projects and our children’s future for which we must maintain a constant state of vigilance.

The conclusion of Ibsen’s play may be disappointing to some, since the Medical Doctor, Tom Stockman, fails to convince his fellow townspeople that the baths pose a serious health hazard , just as the LPG tanks may have left the organizers of the BLAST resistance disillusioned when the tanks were finally built against their objections. Both Stockman and the Blast group might have chosen, in the face of such a heartbreaking outcome, to simply transport their families to greener pastures.

Ibsen imbues Stockman with a stubborn desire to hold his ground, hoping for eventual victory in spite of apparent defeat. The LNG saga has a more agreeable conclusion to some, but not all. There are those whose daily commute must of necessity require passing the visionary reminder, the gift that keeps on giving, unpleasant to the eye but an admonishment to their sense of the eventual victory of courageous resistance against man’s folly.

And what will become of the Tottenville Beach Proposal? It would seem at this point that the private stakeholders have already invested an enormous amount of time and talent in what to them must appear a portent of a great future, since this project is said to be a pilot for the rest of Staten Island’s Eastshore and eventually communities along Long Island’s shoreline and even down along the Eastern shores of North America. They have certainly little to gain from any option to discontinue their efforts, so they will likely “Mitigate” ad infinitum. We have found them all to be wonderful and extremely talented and dedicated people, and, either way we will miss their moving on to their next project when all is said and done.

As to the eventual fate of local powerbrokers who genuinely believe that the Project’s infusion of money into the Beach area constitutes a public good, we understand that they have as much right as we do to assert with equally sinewy vigor their position.

We are equally sure that all will agree that ultimately it will be a shame that any program of such potential import, benefit or harm, must for its final outcome depend

entirely on decisions made by the judiciary, rather than local stakeholders or a more competent system of permitting.

And for us all, it has been a great learning process.

“ Have you learned the lessons only of those who admired you, and were tender with you, and stood aside for you? Have you not learned great lessons from those who braced themselves against you, and disputed passage with you?” W. Whitman, Leaves of Grass.

TOTTENVILLE SHORELINE PROJECT RESPONSE BY TOTTENVILLE BEACH RESIDENTS GROUP--PERMANENT BERM/ELEVATED WALKWAY

Two men looked out through prison bars, the one saw mud, the other stars.

We believe that more than any single issue, short of the abject failure of the Project to engage ALL stakeholders from and including moment of inception, the topography of the Tottenville Beach area must play the most pivotal role in any planning which includes a change of preexisting grade.

Just as any truly encompassing study of the object of this Project must account for the history of local urban planning which has it as its most recent manifestation, so any attempt to provide a truly accurate, unbiased judgement of positive or negative impacts upon the community's present and future must examine carefully the nature of the surrounding landscape, seascape and viewshed.

The most outstanding of Tottenville's topographic features and that characteristic which has historically dominated the town's resiliency to both the rising Baywater and heavy downpours more often than not associated with the most damaging storms, lies in the rate of the land's rise as one moves from the beach area NNW to a backbone or ridge which runs roughly parallel to the shoreline, maybe a mile or so inland. Which ridge reaches an elevation > 80' ,North of the Public Library on Amboy Rd and NNE of the Firehouse also on Amboy.

Rainwater runoff terminating at the shoreline homes must travel this mile stretch while losing elevation and gaining momentum from the hydrostatic pressure resulting, and increasing volume by virtue of the area of rainfall covered in its downward plunge.

It is not difficult to imagine that this runoff reaches significant force at its lower extremities and might constitute an element most relevant to the Project's final rendering.

Consider the following:

1. During the many storms experienced by Tottenville Beach residents prior to Sandy, rainfall had been a major player in any calculation of harm done elsewhere.

Interior flood-prone areas played their usual havoc with electrical outages,, Impassable roadways and intersections, flooded basements and the ever-present potential for accompanying drownings. The Tottenville beach area proved consistently the exception to this constant. Even during the confluence of astronomical highest tide figures with unusually strong Easterly winds, Tottenville Beach residents were always fortunate to enjoy excellent, dependable storm drainage, thanks entirely to the above ground gradient from higher elevations to the Bay's beachhead.

This sloping of land mass toward the water's edge demonstrated time after time, a blessing that limited exposure of property to water damage to a few minutes or so leaving in its wake a landscape free of the many hazards to health and property associated with the mixing of sewerage with runoff that lasts for dangerous time spans in the Island's other shoreline neighborhoods., such as Fox, New Dorp and Midland Beach, whose topography creates today as it has for years, a bowl of many square miles to provide locations for ponding conditions.

This excellent natural drainage deserves credit that goes back on Tottenville Beach for over a century prior to the installation of City storm and sanitary sewers in 1990.
2. Following the above- mentioned installation of sewers in 1990, drainage in the area from the ridge above to the water's edge continued excellent right through Sandy, and the Bay, whose waters during Sandy, rose to a height by 2100 not seen for sixty years, had receded to normal elevations three hours later, leaving no ponding after effect.
3. Shortly following Sandy, a decision was made by Parks and Recreation to Permit a contractor to remove from Tottenville Beach sections of old foundations at the foot of Manhattan St. and a series of healthy trees, some whose trunk diameter reached 4-6 inches, whose presence had mitigated beach erosion for years, along with other rip rap that had served to preserve the shoreline as well.

A decision had been made and was implemented to construct a "temporary berm",using "trap bags" and sand along the shoreline's naturally-occurring primary dune, raising the elevation of the berm about seven to ten feet.

The very first heavy rainfall, which followed a month or so the completion of the berm, presented a major drainage issue, with water backing up a block to Billop Ave, covering the sidewalks and entering the more vulnerable of the homes' living areas, requiring six to ten hours to recede.

In spite of the repeated drainage disaster events which has continued to plague the beach area to this day since the berm's placement, and for which complaints were received by the NYCDEP, this very serious matter dangerous to residents' health and property remains unabated.

To be clear, we are not talking about large storms. We are talking about heavy rainfall of more than 15 minutes duration.

The initial reaction of the DEP was to remove sand that had accumulated to such an extent within a primary outfall along the beach that its aperture was 80% blocked.

When the problem continued to the extent that it proved intractable in spite of the outfall maintenance, the DEP offered the possibility that upland homes were illegally dumping their basement pumpouts into the street.

When the DEP finally ran out of lame excuses in the face of the problem's dogged persistence and some residents' skin growing scales while others grew gills, "all the King's horses and all the King's men" of the DEP posed the remarkable explanation that

the entire Staten Island stormwater system is only designed to contain 80% of maximum calculated rainfall, the remaining 20% flowing along the streets under the influence of gravity, which in the case we are most interested in, inexorably draws that overflow to the location under study with unequivocal causality.

So any stormwater in excess of the 80% capacity will find its way along above surface level to the 66 private residences located below Billop Avenue, 58 of which remain unelevated and thereby as vulnerable to present heavy rainfall and future Sandy like storms as they had presented themselves prior to Sandy.

4. As typically “business as usual “ as the role of the DEP might seem to Staten Island native-borns, this epic adventure truly reaches Orwellian proportions when one considers the reaction of those supporting the inclusion of a taller and more permanent colossus

We believe there is sufficient evidence available within the short but fascinating history of the controversy constituting the proposed Project to claim that there are likely factors beyond securing what is optimal for Tottenville Beach residents at work driving the plan forward in spite of the mounting volume of demonstrable harm already steadily wrought by the flooding described, coupled with the equally demonstrated potential for catastrophic harm in the event the plan is fully implemented.

The following series of reactions by supporters of the Project, we hope to demonstrate in our final Summary, should then be seen in the light of a pattern of defensiveness of the project way beyond a proper balance of potential benefit considered in relation to both past, present AND potential harm.

Initially, that grand, all- encompassing solution of “Mitigation”, a magic elixir always available to respond at a moments notice to any threat, no matter how harmful, actually and potentially, to residents, to the Project’s viability, rose to the occasion with admirable forcefulness, only to be transformed a short time later when it was revealed by the DEP that they had no short time solution to the claim made by residents that the berm was related to the flooding as cause to effect.

The epiphany then provided as response to the existing and future problem of flooding of households was that the two issues of the flooding and the berm were henceforth to be deemed so independent of each other that the flooding would be treated as entirely an issue to be worked out between the flooded householders and the DEP, and the Project would continue its forward trajectory unburdened by its blatant impact on the safety and well-being of residents. Voila ! Hocus Pocus, Mitigation, whatever.

The project presently would seem to have reached a “solution” in a hybrid of the first two positions which would indicate the reliance on an even more bizarre “Mitigation”, involving the incorporation of a “porous”feature in the proposed even higher, permanent

berm which “might” allow the storm waters’ passage through the berm to the Bay, or might not.

A careful scrutiny of this latest proposal necessarily must take into account some realities inconvenient to its successful performance.

Although many, if not most people today have developed a wall of skepticism protecting them against elaborate systems of propaganda and sales pitches for the latest products, the residents of Tottenville Beach, and particularly those not protected by elevation from future flooding, are desperate for any good news that might prove beneficial to their plight. So, at first glance, the erection of the temporary wall “to protect the shoreline’ filled the need for that good news.

Subsequent newspaper coverage and the general tone of CAC meetings served to further that mistaken impression that,the“Shoreline” was meant to include the shorelines’ residents.

The occasional revelation that, in fact, the reference to “shoreline’” did not include any confidence or purpose-driven final end of the Project to eliminate potential flooding only received passing attention necessary to respond to some very illuminating questions posed by those who had not read the preliminary Environmental Impact Statements, or any of the publicity delineating the approach of “you cannot separate wet from dry” of the Project’s designers.

On at least two occasions in the course of CAC meetings, the question was raised by residents concerning the design’s ability to prevent flooding. The reply to the first was the handy magical application of the Mitigation” miracle, but the second remarkably evinced the candor of an admission that the elimination of flooding was neither the purpose of the berm nor one of its anticipated effects. This inquirer’s reply of “Then what am I here for,” as she disappointedly left the meeting, was more forcefully echoed by the Richmond Boro Historian, Tom Matteo, during an interview which was published by the S.I. Advance of 10/29/17. Tom, whose home lies within the Tottenville area that was flooded by Sandy, was quoted, “It’s not going to change the flooding, so why are we spending all this money?”

Should one conduct a survey of residents occupying those 66 most flood prone lots by the beach, and we have, it is not surprising in consideration of the above mentioned lack of the transmission of the most vitally significant negative aspect of the plan to area residents, that only two of the 46 residents polled were unsurprised that the Project’s purpose was to mitigate erosion, not eliminate flooding. And even their lack of surprise was based on, “Nothing the City does or does not do surprises me.

It is also an element of the plan generally recognized by those doing the surveys included in the EIS Appendices, that “Nobody reads the EIS”.

So it should be interesting to those who were unable to be interviewed as to their understanding of the berms purpose when the “porous”amendment reaches the light of

day, but then, they will likely never experience that revelation in their lifetimes, but those who occupy the beach area after their passing might be shocked when and if the predicted Sandy like storm pays its anticipated return visit, and the Bay's waters pour through the berm, as well as beneath and around it.

A second but more practical corollary of porosity will be the role of rainfall volume anticipated in both the heavy rainfalls experienced six or more times annually which currently result in flooding living quarters.

Then we must take into account anticipated rainfall from a Sandy-sized storm whose 100 year likelihood forms the very basis for all the resiliency preparations and alterations to communitie's housing dispositions of which the current Project is an offshoot.

It is a matter of both public and private record that rainfall in Tottenville Beach during Sandy was mercifully light, totaling less than an inch during the 24 hour period of high winds, and dumping most of its contents offshore and in South Jersey, leaving about a foot in Wildwood.

Contrast this with the 2-4' experienced by Texans during Harvey,,and one should anticipate from our next Sandy a rainfall at least ten times greater than our own experience.

It should be noted as well that the vast majority of fatalities from Harvey (82) and Katrina (about 1800) were ascribed to drownings more than a mile from the coast,, as storm waters raised the levels of rivers and streams inland, and the 2016 hurricane Matthew's N.Carolina death toll of 31 was attributed entirely to inland flooding' the point being driven home forcefully that rainfall, not coastal storm surge is more frequently than not responsible for the lion's share of storm fatalities.

Aside from Sandy sized storms, the Tottenville shoreline has been hit by a series of lesser Nor'easters during the last half century,, the first arriving during the winter of 1969-70. All of these storms brought floodwaters to a point above Billop Avenue, inundating the beach streets with two foot deep water.

Each of these storms brought with themselves valuable lessons for those inclined to learn, as countless residents from prior eras also learned in their times back to the turn of the century.

This lesson was that everything that floats or is attached to something that floats and is not strongly secured in place will rise with the elevated waters and be drawn seaward at a rapid rate during the storm's ebb.

The result was the accumulation of an enormous volume of flotsam along the Southern terminus of the beach streets, similar to the collection deposited by Sandy hanging from tree branches and clogging the storm drains installed in 1990 in the lowest lying streets, not presenting a drainage issue only because the water then was allowed to flow right over the beach' s primary dune into the Bay.

It is this phenomenon's logical result that would likely create a similar condition as the berm's pores clogged with debris to the same extent as had previously impeded the flow through the storm drain catch basins.

EYES AND EARS

It was on the Ides of March (15th) of this year that the latest of a series of public meetings of the NYPD's novel neighborhood policing approach was held in the evening at the MIV's CYO Center.

The purpose of the gathering, and the new program, was to better enable the local police to respond appropriately and more efficiently to potential criminal activity in the Sector which includes Tottenville Beach in its purview.

In attendance were representatives of local elected officials, members of some NYC agencies expressing interest in this approach, and representatives from the local Tottenville Residents Group.

A listing of recent crimes reported and investigated in the Sector was announced, followed by an explanation of the investigation results and actions taken.

There followed a lively discussion of actual and potential criminal activity in the beach area, emphasizing the importance of citizen participation in detecting and reporting such activity.

The crimes investigated in the beach area ranged from home break-ins, to auto break-ins, both involving damage and theft, to drug related crimes, summons issued and arrests made, and summons issued for fires along the beach.

The problems associated with littering and garbage dumping were discussed, and recommendations were explored for the placement of signs to remind and hopefully deter those who might otherwise become perpetrators.

The meat of the discussions that concerned Tottenville Beach residents focused on the excellent results so far exceeding expectations of the cooperation between police assigned to this program (NCO) and the residents themselves, what the NYPD spokespersons referred to as the "Eyes and ears" that animated the program's effectiveness so pervasively.. Time after time, in incident after incident, actions were undertaken that would likely have not been possible without this cooperation, consultation and coordination between beach residents and Police.

The reliance by the police on the vigilance of local beach residents was lauded to no end and the continuance of more of the same was strongly encouraged as an essential sine qua non of any future success of the program.

"You residents are the eyes and ears of our efforts, and all continued crime suppression depends on local participation in the crime detecting process."

It was that point in the presentation which further zeroed in on criminal activity along the beach itself, which factor was expected to increase with the general increase in criminal activity in all of the Sector.

The plans for a replacement of the temporary berm with a permanent and higher one and an elevated walkway quite naturally followed in the wake of the discussion of the forced entry by breaking a rear window of a nearby home, unoccupied at the time. The importance of leaving no telltale signs such as mail in the mailbox, unshoveled walkways, etc of absence was discussed, as well as keeping an eye on neighbors' homes when they were absent.

The beach as a backyard entry and surveillance point for break-ins was discussed, and the potential for criminal access with and without the elevated walkway.

The existence of a solid barrier erected between the residents' homes and the beachfront deprives the nearby residents of the greater share of their ability to monitor potential criminal activity along the stretch of beach from Page Avenue through Brighton St, which has been on the rise.

At the same time, it impedes local residents' ability to identify any activity occurring along the bayside of a barrier which might require the help of either residents themselves or local emergency response agencies.

IF YOU SEE SOMETHING SAY SOMETHING

Particularly during hours of darkness, sounds from the waterside of the berm include loud voices, sometimes from what could likely be construed to be children and women in distress from whatever cause, children screaming amid splashing sounds, and the sound of motor driven vehicles speeding along the beach.

We are all familiar with NYC zoning laws requiring neighborhood swimming pools to be fenced in for safety and yet Staten Island's beaches have no such safety measures along their shores.

During the last half century, there have been at least two adult and one teen drownings reported in the beach Sector of the 123 Precinct and countless close-calls, all in the Bay.

We have witnessed innumerable marine incidents of small and large vessels and their crews in distress, both in the water's depths and along its shores, whose happy outcomes owed a great deal to the vigilance and rapid reporting of their exact location and disposition, none of which could now be the case due to the current temporary berm and its taller permanent replacement, which no amount of increased patrolling by the NYPD could remedy, nor any type of surveillance replace.

Most of these potential tragedies would not have been preventable without direct visual confirmation of their location.and need.

The concept of NIMBY is a double-edged sword. While residents don't want projects they view as harmful not only to a way of life but at the same time of drawing serious

harm to their life itself, neither and even more vehemently will they tolerate a nearby assault, drug trafficking, and other crimes in their environs. They are quick to react to those of their fellows in distress from accidents and dangers to the life and health of their neighbors.

Prior to the berm's installation, they were able to come to the aid of lost tourists, young children, provided first aid or even a glass of water as the need arose, rescued abandoned animals and injured seals. They notified various City, State and Federal agencies of vessel groundings, including those of the two tankers mentioned in BREAKWATERS.

These residents have actually mitigated or eliminated and prevented many potential disasters along the beachfront, day and night, which actions would have been either more difficult or impossible without the visual acuity required for such responses and the accessibility required for hasty action.

Which brings us to precisely the characteristic of accessibility.

It would appear that the matter before us can be explored most fruitfully from a number of perspectives.

At first glance and as a practical matter, there is no doubt a popular notion that a simple definition of private vs public property might suffice.

We all have very defined private property lines which separates property over which we exercise ownership from public property owned by City, State and Federal forms of governing bodies.

With ownership, public and private, come rights and responsibilities on both sides of the line.

These rights can be seen as natural and government recognized, or governing body generated, and both ownership categories require recognition of all parties to be realistically exercised.

Some property lines are more fluid than others, lending themselves to a variety of applications among differing circumstances. Strictly speaking, private private lines in NYC do not extend for the most part to the curb, yet private ownership of adjacent property involves responsibility for sidewalk safety, cleanliness and passability.

Just about everything on, within, beneath, above and around private and public property is ensnared in regulations set and enforced by legal entities having jurisdiction, rather than ownership.

We park, drive, push and direct our autos, bicycles, carriages wheelchairs and bodies along property considered public and private. Our trees extend beyond our property lines and their leaves shade and drop into other's properties. Their branches create beauty when they bloom and hazards when they fall.

Owners rights and responsibilities in some cases extend enormous distances beyond the lines, rising to the zenith above and a nadir below.

There are solar rights, wind rights, light and air corridor rights, all encoded in building and zoning laws constantly being amended, interpreted , reinterpreted and applied in various fashion by various concerns.

Rights and responsibilities are not the only categories involved in disputed property lines.

There exist, for example, right here in Staten Island hundreds of accommodations that the Staten Island Borough Dept of Parks and Recreation has made as modi vivendi, with owners of private properties contiguous with property over which Parks exercises jurisdiction, some described as encumbrances and others shared in common either currently or by contract initiated or terminated at some past or future date.

There is also the PUBLIC TRUST DOCTRINE, as applied to shoreline accessibility to the public, whose flexibility of time and place has been aptly demonstrated by an even cursory examination of the variety of applications by different States own regulations derived therefrom.

In the situation under consideration of the Tottenville Project, the greatest public access had been provided prior to the placement of the temporary berm, which access would be further diminished if the new, permanent and higher berm should replace the existing, lower, temporary one.

Since there were, as long as anyone can remember, nine streets running perpendicular to the waterfront between Hylan Blvd.and the beach, and at least four of these access points have already been eliminated by the temporary berm, followed by three more going the way of the first four, would the Shoreline Project be undertaken as is, the plan itself would reduce nine access points to two, 1600’ apart compared to the original 200’ apart.

Not only would the seven street’s access points be drastically and unreasonably eliminated under the Shoreline Project, but the access points formerly running along and parallel to the beach contiguous to private property would suffer the same fate.

So the total reduction in shoreline accessibility under the Shoreline Project’s Proposal would amount to the loss of a full 1600’ of precious footage, from 1700’ to 100’.

Even discounting the private access, itself a hard pill to swallow when one considers seriously the implication that the residents whose homes occupy the private property would then be considered less entitled than those whose homes lie elsewhere, as though a penalty rather than an asset could be attached to the choice of paying higher real estate taxes, this proposed ill-considered loss of public access measured solely at street terminations @ 50’ /street width, would amount to a loss of 350’ of the 450’ extant, tragic by any measurement,,clearly violating both the intent and letter for which the PUBLIC TRUST DOCTRINE was designed.

What, we must ask ourselves, of that sense of ownership and civic concern so necessary for the optimal functioning of any small town, that presently motivates and informs the current shoreline homeowners' desire to preserve the beach's accessibility and thereby its attraction to all by virtue of the security from harm to those who may visit and frequent its watery realm?

How, we may very well ask ourselves, does the security wrought by having the eyes of those residents most concerned and impacted, on the great variety of criminal activity that threaten beach goers themselves, outlined at the recent NYPD NCO meeting, how does that security weigh against the choice of beach replenishment by traditional methods rather than the fool's errand that would block any and all eyes from beach surveillance day and night?

Finally, what of the increased likelihood of greater threats to life and property of all beach goers due to the provision by the plan for an ideal location for criminals, intending harm to all residents,, from which to plan and launch their forays into properties, public and private, immediately abutting the cover provided by the elevated / berm/walkway?

GOSR LIVING BREAKWATERS TOTTENVILLE SHORELINE:

Summary Conclusion

Response to Final EIS of Tottenville Beach Residents

PRIORITIZATION- This Final EIS continues, as we believe has been evident since the Project's early planning stages, the pursuit of an assessment of the needs of the local Tottenville Beach Community diametrically at odds with the needs witnessed to by members of the community at public CAC meetings and acknowledged by anyone even partially unable to share the Project's obvious, continual and unwavering bias in favor of its immutable completion.

Prominent, central to, and self evident, as delineated in every post-event study published by FEMA of all the major storms, including Sandy, is the need for protection from flooding caused by the rise in water levels in seas, bays and rivers, and intense rainfalls inland. often measured in feet rather than inches.

Again, in that Tottenville beach area below Billop, which is that area whose low elevation occasioned the greatest storm damage, a paltry six homes out of the 66 so located have been elevated, a full 5 years and 8 months since Sandy, leaving 60, or 90% of the total 66, unprotected from future storms.

The protection offered by this Project has come down to a possibility of lessening future beach erosion by the placement of offshore breakwaters and possible protection of the beach shoreline itself, NOT the homes and lives of its residents, by a massive stone=cored seawall.

How to understand this apparently narrowly conceived plan of a triumphalistic culture that seems to pervade every reaction of the Project's perpetrators and supporters, to our responses to the Project's most lethal unintended adverse consequences that should inspire intense concern on the part of all involved, even more so in its main protagonists?

Has "Nero been fiddling" in preparation for the next flooding response debacle?

Among the many volumes devoted to attempts by some urban planners to support the forward headlong momentum of projects manifestly more harmful than beneficial to communities suffering their impacts, there are somes device employed that readily reveal themselves paradigmatically encased in the planning stages so steadfastly and repetitively that many influential studies have allowed for a convenient testing of their occurrence within this Project:

DENIAL- unethical and/or amoral urban planners commonly refuse or are unable to engage with any information or findings at odds with their own.

The very core of the CAC's philosophy of Denial reveals itself remarkably well in the policy of muting all discussion by application of a practice that prohibits any meaningful exchange.of ideas by recording such and responding in an impersonal and selective future message, written, contrived and devoid of direct relevance, negating any possibility of the direct interpersonal exchange of potentially beneficial input that all successful and legitimate stakeholder theory recommends.

DISMISSAL- experienced at the public meetings in short, stunted, minimal engagement, particularly apparent in the not-uncommon rejection of "non-expert opinion", offered by "laymen" as necessarily faulty or irrelevant due to its source exclusive of the field of "Professionally elect superiors" employed by the Project. A non-starter in any meaningful dialog.

DIVERSION- This is an area of seeming deception in which this Project really comes into its own, displaying creative talents unmatched by the most accomplished and professional of spin merchants, weaving fantasy upon fantasy, with an entire CAC meeting devoted to choosing the purposes to which an educational "Hub", magically stretching relevancy to its "Resiliency" limits and somehow ancillary to the plan's objectives, might be put.

The strategy escalates to heights unseen in previous projects in its dedication to studies of avoidance of harm to all creatures of land, sea and air, present and future, with the sole exception of the mainly land dwelling, long suffering, storm weary, poor-urban- planning victimized, and more recently emergent homo sapiens species, occupying some extremely low level rung on the Project planners' ladder of compassion, if not evolutionary competence.

A possible definition of rabid environmentalism might include "the belief that the worst event that has transpired on our planet is the arrival of Mankind," and that it would be in the planet's best interest that this most invasive of all species should be witness and agent to its own extinction (by flood?) ASAP.

It must be truly amazing to even the most untrained mind to be witness to this Project's unremittant and unconscionable avoidance of concern for the welfare of those members of our own species most harmfully and potentially lethally impacted by its most egregious and gravest errors in judgement ((eg-the belief that ships traveling nearby channels could not ground in the areas envisioned for the breakwaters because their draft would be greater than the maximum depths of the breakwaters' area of placement and that collisions of watercraft with the same breakwaters might be prevented by simply following Coastguard guidelines.) and failures in responsible urban

planning protocol, as the Project maintains its obstinate intention to locate, in one of the busiest and densest intersection and interaction of people, petroleum products and pleasurecraft on the entire NE Coastal corridor of the U.S, a gauntlet of stone based reefs whose composition and placement could not evince a more determined effort at the destruction of watercraft of all sorts, than many ancient or modern military instruments.

Additionally, at the very heart of the Project's goals of lessening coastal erosion,is a DISPLACEMENT of what all beach residents hold as primary to their hopes of any truly relevant public work in this area. We are again referring to meaningful protection from future storm flooding. For proper and early management of what is THE problem at hand, flooding, the Project has substituted an untimely, far fetched, toss of the dice, stretch of the imagination journey in the Neverland of BIOGEO science whose degree of certainty is modest, if not null.

We also entertain other possibly more primary factors, or mindsets, that may be influential in the refusal to allow any contrary finding to threaten the Project's viability.

There is an interpretive framework which dictates an understanding of the process of learning and knowing that some would call absolutist.

That is, that it is both possible and likely that we humans are capable of arriving at a state of our understanding of our universe and any of its aspects and dimensions, that is inerrant or infallible.We may not only arrive at certain knowledge, but in some circumstances, such as the variety of areas studied by this Project, the investigations involved have actually done so, a fait accompli, no exceptions allowed or at least seriously considered.

This worldview runs contrary to that understanding of understanding that might be described as epistemological modesty, that all knowledge is tenuous at best and thereby subject to constant revision, reinterpretation, amendment and critique, that all criticism, whether positive or negative, is not only to be expected, but is to be actively, diligently and necessarily sought, and every stakeholder in every planning process, is entitled to as much courtesy and consideration as every other stakeholder, regardless of education, title or relevancy.

This view of knowledge recognizes both the possibility and likelihood that there are as many sources of knowledge as their are fields of learning, some more forthright and recognized than others, and that knowledge does not progress by a process of simple accumulation, but rather is always and everywhere requiring challenges to currently held beliefs, and requiring submission to new ideas, as they reach an ascendancy that renders traditional ideas untenable, in the full acceptance of each novel finding or innovative technique as equally tenuous and subject to future mutation.

Every traditional “fact” then, stands in constant tension with its eventual replacement.. As Steinfeld said about children, “ Make no mistake. They are here to replace us.”

As for the modern sciences themselves as accurate measures of reality and predictors of future outcomes, their commonly accepted exclusive dominance as reliable predictors of anointed outcomes has been short lived in academic circles, Rising to prominence in Europe during the French Revolution and enduring its most withering criticisms in our own country in the 1950’s and 60’s, with a less invalid understanding of its proper place in a much more complex hierarchy of knowledge, Within the general rubric of a “Philosophy of Science” among theoretical scientists, and whose wide acceptance among cutting edge sciences has yet to peak.

Representatives of this more current and less inaccurate model of the loss of primacy among professionals’ self-understanding is for example, that of Dick Feynman, born right here in NYC, widely regarded as the most brilliant theoretical physicist of his time (died 1988), who wrote and lectured,” Science is a culture of doubt”. “We are trying to prove ourselves wrong as quickly as possible, because only in that way can we find progress.”.Anyone who says they understand Quantum Mechanics doesn’t understand Quantum Mechanics.”

Another “Take” of reality that we speculate might lie within the zone of interpretations which divide the Project’s supporters from ourselves might very well be a sense of the inferiority of the criticisms advanced by opponents of the Project insofar as these are seen as inimical, inconsistent with, or at cross purposes with the Project’s findings, whose patient and seemingly exhaustive efforts have been profusely layed out in the EIS’s impressive appendices.

“Who are these unwashed country bumpkins”, they might ask themselves, “ to imagine for a minute that their opinions should be worthy to stand elbow to elbow with the expert, professionally regarded, licensed and permit capable findings of our highly compensated elite. Were it not for some arcane practice of informing them of our progress and allowing them access to our plans, they should be not only superfluous, but detrimental to its expeditious completion. Fie on them.”.

Thus the rise of a movement to ignore, bar, silence or otherwise malign one of the project’s most vocal critics, who, as spokesperson for the Tottenville Beach Residents, has become quite expectedly, a target of aristocratic avoidance.

At this juncture we find ourselves returning to the issue of “expert” vs “indigenous” knowledge, essential to any treatment of urban planning.

At first glance, and without the benefit of the summary above of recent developments in our understanding of noetic graduations,we might consider this comparison a no brainer.

After all, does one consult a Medical Doctor or a Witch doctor? Do we fill our prescriptions at a Pharmacy or buy snake oil?

Reliance on the non expert/non professional is usually seen as foolhardy. “The one who chooses to defend himself in court has a fool for a client.”

The actual issue before us, we would submit, is much broader and of greater depth.

We need look no further than the last Presidential election in our own country for evidence that there exists among the general public at this time a general distrust of the expert, the professional, the career go-to-person.

By and large, we still bring our medical problems to the M.D., but we often defer to a second opinion, or even the easy and inexpensive internet access, which has come to, in many ways replace or even surpass the “expert” with findings of “many experts”, available to and made use of by Medical personnel themselves, likely more often than and more extensively and intensively than the non-expert patient, whose input to treatment now forms the major portion of medical decision making, the mantra of one of the founders of John’s Hopkins in Baltimore being. “Listen to the patient. He knows himself best.”

It is at this time a policy of many NYC agencies to hire more than one “expert” opinion, unable or unwilling to trust in a single source.

It is also just as likely to find basic disagreements in all fields among those fields’ theorists and practitioners. One will try in vain to find two surgeons in any hospital precisely on the same page, or in the directory.

There is no expert free of advocacy or value choice, because experts are human first and foremost.

What’s more and more important, this Project is not scientifically unidimensional, as the appendices attest.

In fact, the Positive Sciences(Bio, Chem, Phys and their offshoot combos) should play a secondary role in the deliberative process, since the issues debated have been Positive Science related, but are mostly not Positive science based, being Socially contentious(Harm vs Benefit).

Aspects of disagreement in this project are regularly accompanied by arguments grounded in social, political and economic concerns.

What constitutes the most pertinent expert knowledge has been, we would try to demonstrate, so far afforded insufficient attention or none at all.

Whose expertise is relevant and to whom? Can there be said to have developed an area of expertise among the local Tottenville Beach populace that rivals, or may be even superior to, that of the experts employed by the by the Project, insofar as it applies to the subject area and population?

We have already listed some historical areas of expert-guided development along the Tottenville waterfront which have been abject failures.

And there is the tendency for any Project, given enough time, finances and lack of truly critical management, to take on a life of its own and sustain more and more momentum more difficult if not impossible to check.

Exhibit A is this Breakwaters Project which promises to create havoc in its sphere of influence locally as one collision after another provides fodder for our local cemeteries, and promises the possibility, if not likelihood of transforming a local hazard into a regional catastrophe when a petroleum laden vessel pays it a surprise visit, putting Tottenville Beach higher on the ecological disaster list than Love Canal, Three Mile Island and , with a little help from the Advance, eclipsing even the Exxon Valdez.

But hopefully, by then, the human element staffing the Project will have moved on to ever greater accomplishments, and the Rip Van Winkle political community retired and pensioned, and only the local residents remain to grieve their losses and reap what others have sown

We briefly summarize what we see, after careful and thoughtful study of the Final EIS, as the major potential assets and flaws of this Project.

Breakwaters / Berm to lessen beach erosion-reliability of studies

Those familiar with raritan Bay's Tidal and Wind influenced currents deem many of the project's attempts to study and thereby predict and influence shoreline wave and current activity naive. The doubtful results of wave height, period and direction rely heavily on a single metering location that cannot and should not realistically be generalized to the multiple reef locations envisioned.

As any mariner experienced with this part of the Bay's shallows will testify,, the complex pattern of the interplay of tidal current and wind direction, wave motion and profile, influenced constantly and unpredictably by wind and wave patterns way offshore that drive their own varying wave fronts into our Bay, vary with as much irregularity as the weather that creates them. Beyond the Summers averaging warmer than the Winters, long term weather events remain unpredictable, and only a few still rely on the Farmers Almanac meteorological fantasies.

The excitingly interesting results of of the grand collection of appendiced studies notwithstanding, the tabulated evidence collected is peripheral at best to the paramount issue of wave and current over time, as stochastic and elusive quarry as the ocean currents, with additional variables of continually mutating bottom profiles, salinity and viscosity shapeshifting with every rainfall runoff and seasonal collection of detritus from local tributaries.

Extrapolating results from a single location to the variety planned leads to a probable conclusion that what requires at the very least a more multifaceted study over a much longer timespan, less biased and more independently validated, may lead to outcomes evidence informed, but advisedly not evidence based.

This time-constricted of an extremely complex biological, geological and physical subject area which is designed to be prognostic of decades of future events, must necessarily suffer from oversimplification, misplaced emphases, unintended errors, omissions, confusion of evidence of incidence with evidence of prevalence,, and should at best be evaluated as prelude rather than conclusion..Evident are problems with scale,
term and transparency and independent verification.

We feel we have already addressed the issue of public access adequately in the treatment above.

Creation of Social Resiliency

Every reference to the function of the Hub,however envisioned or wherever located, fails to account for the redundancy of this program with existing educational assets Buildings and staff and equipment specifically designed to most if not all requirement the plan wants to implement better and more efficiently. The resiliency element ,as others in this Project, would seem to have been included for no other pressing need than to qualify during the Project's competitive stage, and remains entirely disproportionate and distracting from the immediate, inadequately addressed needs of this Beach community for relief from present and future storm flooding threats to property and life.

Ecological enhancement First, Cause No Harm

Most egregiously contradictory is the process by which the City trades resources at the expense of local communities.

The approach that the total composite sum of resources, such as wetlands, trumps the actual occurrence locally, is grossly discriminatory. The Project ask us to do without local resources so they can be placed elsewhere? Certainly the height of neglect !

TOTAL POTENTIAL BENEFITS

Maybe a lessening / elimination of erosion? Maybe not? Who will be there to readjust/relocate these massive structures when they follow in the well trod footsteps of this Parks past boondoggles?

TOTAL ADVERSE EFFECTS

WE believe a further treatment of the Berm/revetment/raised trail 's increasing likelihood of increasing opportunities for criminal activity and decreasing safety for all who use the beach has been adequately covered above.

What has been the Project's response to the constant ponding from heavy rainfall experienced by beach residents as the rising water enters their homes since the building of the temporary Berm and would seem to be likely exacerbated by a permanent, even taller and wider replacement?

The solution most recently announced by the Project's managers is one that describes the proposed Berm as "Porous".

Porous concrete has been around long enough to provide a fairly reliable track record, and its vertical cousin, porous berms have been employed even longer.

So the efficacy of these structures is fortunately, unlike the breakwaters,not so fraught with uncertainty as to challenge reliability .

But the devil is in the details, an area that the failed carriage trail/rebuilt Russell Pavillion project wasted so much money on fourteen years ago.

Porous concrete must be maintained, preferably quarterly, by application of solvent where required and vacuuming or power washing, or rick becoming ineffective in its permeability, PARTICULARLY IN AREAS where there might be a concentration of particulate matter that might clog its pores, viz -the BEACH

The other type of berm that has enjoyed greater freedom from inadequacy has been around even longer. It involves using materials much larger in such a way that passages are created that would not be clogged, such as large, irregularly shaped stone, with openings even larger, such that a person could pass through ,allowing rapid passage of water to provide adequate drainage and make drownings less likely. We are almost certain that we will be truly delighted by the final product, as we have been by previous iterations.

Finally, we must take another look at what we see as the Project's signature presentation, as well as its most incongruous connection of gerund to noun:

LIVING BREAKWATERS

But then, what and who are we to say, as members of a species denigrated regularly by the Project in favor of microbial and otherwise evolutionary gifted phyla?

After all, these rocky dull gray protuberances above the Bay's serene surfaces may one day serve as haven, resting, perching and nesting ground, such as CYrano's outreaching nose, providing temporary and permanent lodging facilities for the disease vectoring gulls already mentioned along with every sort of flotsam that wanders by, dead or alive, and may even grace our tranquil berm , rooftops and HVAC intakes with clouds of odiferous airborne members of proteo and viral species, delivered free of charge from far away places.

But we wax too prolific. Let us rather speak of the reality of more thanatological associations of the plan's crowning nomenclatural asset.

We refer again to the still living members of our own species who teem, especially abundantly in the warmer months, on the waters under consideration, and whose presence may, in the presentations dreamily offered by the Project, only increase dramatically, as the breakwaters draw hordes of those who would otherwise be required

to travel at great expense, great distances in air and on sea,to what will certainly become a new Bermuda of the North, with our own ring of reefs.

A paradise indeed and all at the hands of our own GOSR.

A sign at the intersection of Tottenville's Parkways may verily read, "WELCOME TO TOTTENVILLE BEACH, HOME OF THE LIVING BREAKWATERS: Boating capital of the North, and in smaller print below, welcome to higher crime rates, oyster beds whose "sharps" promise to "make your day" in the local ER, Death by a thousand cuts, whose proliferation of droppings and other bird disseminated bacterial goodies will not only make your day in the ER, but may very well provide a lifetime of hospital related experiences ".

Pleasure boaters of all types roam the Ward's Pt Bend waters day and night,summer and winter. Fishermen are a hardy class, whose presence in these waters is not confined to warm weather. Travelers who sail from other ports also arrive in cold weather, generally ignorant of local hazards.

Most local boaters do not carry either paper or electronic charts, and warning lights of any sort are compromised in this area by the proliferation of shorebound lighting, wherein it becomes extremely difficult to distinguish close up lights from distant ones.

And breakwaters, however marked enjoy a reputation as killers of motor boat operators, usually accompanied by alcohol and noncompliance with personal flotation device recommendations.

Sad to say, the average boater in this area, when invited for a day's sail, will usually show up with alcoholic beverages, unless instructed otherwise. Many will even decline the invite if so deprived.

The Captain of the Exxon Valdez, when tested post-grounding, was found to have an illegally high alcohol blood level, which, it is speculated,, may have influenced his decision to go below shortly before the grounding, placing the most inexperienced mate at the helm.

One might consider these circumstances to be beside the point, since responsible people, one might opine, don't drink and sail, just as responsible people don't drink and drive But responsible urban planners don't design plans based on ideal cases, but rather include real world circumstances in their deliberations.

Once placed, these Breakwaters would require another big bite from the Money Tree to remove when they fail to perform , or perform too well as instruments of destruction, and no doubt, encounter another groundswell of objections from the Oyster huggers, referencing ecological concerns.

PETROLEUM

Ballast Tanks

Bulk carriers of liquid petroleum products are designed and built to include ballast tanks, placed at locations aboard ship to ensure stability of the ship, both at sea and

during loading/unloading of cargo in harbor and/or at dockside. These tanks are part of the vessel's structure and are designed to be filled and emptied in harmony with the loading/ unloading of cargo, to maintain stability and trim and designed submersion of the hull form and full propulsion(Props) capability, which determines maneuverability and safety.

Ship continually use fuel for propulsion and operation of on board energy production.

Crucially, tankers must adjust trim by adding ballast to insure ideal hull submersion in anticipation of heavy weather at sea.

The relevance of this practice to our study is that there exists an ideal draft, or degree of hull submersion that oil carriers aim for as determinants of stability which means that as cargo is unloaded ballast tanks are loaded(With water).

So a ship unladen with cargo might prefer to an extent equal to or greater or less than its cargo draft, subject to the Captain's assessment of desirable draft.

AN ECOLOGICALLY BALANCED JURISDICTIONALLY PERMITTED POLITICALLY LAUDED NAUTICAL GRAVEYARD

A count of vessel types traveling the Ward's Pt Channels would find that the majority of oil carriers are not of the large bulk carrier type as the Exxon Valdez,, but more often an adaptation for the shallower draft of most harbors' petroleum storage facilities.

These Integrated Tug Barges and Articulated Tug Barges, as the name implies(ATB and ITB), are combination vessels connected by retractable "pins" These vessels enjoy the privilege of drafts that allow them entry ways to shallower waters than their larger counterparts, ranging in draft from 10 to 33 feet.

NYC is not only the largest importer of oil on the east Coast , it is also an exporter of oil, and the timing of loading/unloading is extremely important due to fluctuating oil prices, so much so, that a laden vessel often arrives and begins unloading only to cease the operation and leave and anchor or moor or just drift in the "Holding Ground" adjacent to Ward's Pt anticipating this change in price. So vessels inbound as well as outbound carry oil and must be loaded the extent either with ballast or oil and more likely a combination of the two

And how many such oil carrying vessels ply these waters on a daily 24 hr basis today?

We organized a "boat watch" from 7AM to 7PM for the five days July 2-6.
We recorded type and draft for each vessel, using binoculars to read the markings required on vessels sides which provide numerical values at two foot intervals or every ten decimeters. There exists a second set of marks a Plimsoll line, which reveals that level of loading beyond which a ship should not be laden for safety's sake.

Using these results we concluded: 44 AITB's plus 19 tankers

Since most commercial shipping by sea takes place during nighttime hours, doubling these figures would likely result in a conservative estimate of 88 and 38 per 24 hour stretch

During this same period the average draft of just the IATB's was a median of 17'

So < 17' would seem to be a fair estimate of IATB of half the 88 IATB's yielding 88/5= 17 vessels per 24 hrs divided by 2 = 8/day with drafts sufficiently shallow to ground on the breakwaters at or around high tide. There are two high tides /24 hrs, each providing two hrs on each side of the high tide time for a 11/2 ' differential either side of the high tide figure so 8 hrs/24 would allow 8 IATB's/24 hr sufficient depth, so 8 vessels/24 divided by 8hrs/24 -- about 2 vessels/ 24 would be of sufficiently shallow draft to ground at the breakers should other circumstances compel such an event.

It has already been established by actual historical precedent that such groundings have taken place with full sized tankers of much greater draft likely at least partially laden by a ballast/oil combination, with the bows approaching the beach at a distance of approximately 150' and a low tide depth at the bow of approximately 2'.

Comparing these figures with the calculation already presented in the earlier appraisal of risk with the Exxon Valdez example, considering the enormous difference in number of interfering pleasure craft, the much narrower channel (9000' to 700') the 110 degree blind turn, the large ship/barge holding area adjacent,, the confluence of three busy channels, the proximity of many boatyards and yacht clubs with a mooring field of about 40 boats immediately adjacent to the West, any truly impartial mariner to either a paper calculation or the nautical assembly on site, would agree there can be little doubt imagining the greater risk of the breakwaters to oil vessel grounding.

It would seem that there should be a need to say no more in objection to this proposal.

There exists, however, a further explanation beyond momentum, greed, political advantage and fear of admitting to yet another failed program.

We refer to a proclivity on the part of us all to hold fast to strongly held and particularly long standing beliefs way beyond the point that might be considered the "rational" balancing point where recently acquired information would logically appear to outweigh the strength of past traditional evidence in swaying opinion and resultant action. This tendency has been manifestly and voluminously documented in the popular literature, such as Tom Kuhn's "Structures of Scientific Revolution" orb "The Tipping Point", among others.

We avoid even the appearance of evidence that might require of us a real, sincere questioning of stands we have taken and advice we may have given and judgements we may have made..

This is not only understandable but laudable, for experience has taught us that the much greater number of novel ideas and experiments have been found wanting in the long run, and there is a security that we all seek and deserve in the Status Quo.

But there comes a point in all of our encounters with changes approached and ideas challenged, when denial is no longer an option if we are to truly grow as individuals as members of a growing community.

That point might very well be way beyond what rationality demands. It might be painful and it might be dangerously risky. It is , however eminently necessary if we or our children are ever to share a society of justly deliberative processes of urban planning worthy of a democratic governing social fabric.

Should the decision to continue to implement this Project be attributed to human error or outright deception? A combination of the two often leads to horrible outcomes, not for those who enact the mistaken action,,but for those unfortunate to be victims of its non accountability,and the greatest lie we can tell is the one we tell ourselves.

Poor planning has been, even prior to Sandy's arrival a constant companion to our City and State's admitted repeated failures, demonstrating itself a part of a megastorm's problem instead of prelude to a solution.

The tendency of the temporary berm to create ever more problems from even heavy rainfalls can be seen as early harbinger of many more less benign outcomes ahead

Local beach residents bring many reservations to their reading of this Final EIS, not the least of which is a fear that even their very lives have not been accorded that minimum respect without which any urban project should even be imagined.

A strident and undeserved optimism jumps out of every page.

Hovering over the Project and foreshadowing the worst of outcomes has been a sense that the Project's architects have little understanding or concern for those most adversely affected,exhibited at its most obvious by the nonchalance with which the residents' entreaties have been dismissed.

The proceedings of the CAC have been a disgrace, not so much responsible for the deformation of the concept of bottom up participation as it is its product, groomed, fed and inspired by the elitist mentality of "we know better.".

We wish for many things, looking forward to the day when the full range of a truly democratic process will play its necessary but not inevitable role in public discussion and policy.

Many worker's lives had to be sacrificed before the Bloomfield Tanks could be stopped.

This Project has been a seriously flawed process leading to even more seriously flawed outcomes, one funeral at a time.